FERRANTI

NEWS IN BRIEF

US may ease AT&T path

THE US government's Federal Communications Commission is propering moves which would make it easier for AT&T to compete with Satellite Husiness States Systems ami others in the data communications market.

The moves involve a change in the 1950 consent agreement between the Justice Department and AT&T which precludes the letter from entering any data processing loadness. The Justice Department is, however, opposed to any change in the consent agreement without structural alterations in AT&T. principally the sale of the Western Electric manufacturing

ICL's graduates

THE first 30 nun-white students to graduate from ICL South Africa's training school for progrummers ond operators received their certificates from ICL manuging director Dr Chris Wilson in Johannesburg this

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FV36 OECMICAL II

Link-up delay

OVERTIME ban by the Post Office engineers is contributing to a delay in linking the New-costle University. Multiple Access Computer system with an IBM 370/168 and 360/67, to the network that links London University computers.

Standard parts.

FOR the sake of standardisation, British Leyland has decided to slop using NCR's PCMI Ultraiche for lis car parts cataloguaa n favour of atandard 48X nicrofiche produced on COM. This will ollow one reador to be used for different companical

Question on race may be cut from census Till: next census, in 1981, will contain a position on implementing the BCS suggestion asking people their race, according from that there should be independent housing, etc. It would be preferable if it was

US may block

sale to Soviets

The message switching sya-

tem is needed in part to provide

Daniel Patrick Moynihan, who

sald of the computer, "It would help the Kreinlin keep track of

the Data Protection Committee, which is tion, she said. The revently published White Paper on already very late. No names and addresses the census affirms the importance of will be entered on the computer.

maintaining security of the central comthat a, but it says the government reserves its race would only be acceptable if it was tied what race he is.

to current government proposals. Health monitoring of processing centres.

Murister Roland Moyle said, however, that monitoring of processing centres.

Before taking any decisions in this area otherwise many people would be refuetunt the question might be dropped if there was a the government will wait for the report of to answer it and would then face prosecu-

The question would have to be carefully phrased to avoid confusing ruce with reli-gion, she odded. Also, it must be the responpoter system that will process the census for Civil Liberties, said that a question on dent and not the census-taker who decides



Shedow Industry Socretary Sir Keith Jeseph officially opened the factory at Crawley, Sussex, where Redifon Computers olms to produce 50 of its R-rango distributed processing systems each menth (CW, April 13). Sir Keith is seen here discussing configuration testing with Redifon Computers' managing disease Reffer. mi 13). Sir Keim is seen nere biscussing configuration see. Int with Redifon Camputers' managing director Roffen

sident Carter returns from the facilities for sports journalists at economic summit meeting in the Olympic Games, but US Bonn, Neverthelcas, Robert critics of the proposed sale be-Byrd, majority leader in the US lieve that the system has con-Senate hos been quoted as siderable potential for use in saying that the sole has been "internal security". blocked — ot less temporarily. Leading the chorus of criticiam has been New York senator

Despite the apecuintion surrounding the fate of the order, Univoc itself has heard nothing. "We ore having to read about help the Kreinlin keep track of every dissident in the Soviet office in London, which is res-

it is understood that a final

decision will be mode after Pre-

oublic outcry against it.

Zbigniew Brzezinaki, prensible for Eastern bloc sales.
"We have heard nothing adviser, is understood to favour ponsible for Eastern bloc sales. official cither way from the De- the use of trade as a weapon in partment of Commerce. If the sale has been blocked, it would treatment of those-within the ba e departure from normal procedure for the decision to be government, and a meeting on released generally before we were informed. We are in the the subject is believed to have laken place jast week between position of interested by-Brzezinski and White House

Univac has already waited almost a year for the Department of Commarce to grant an export licenco for the machine. The contract, for a small 1100, given by GoCom, the West's co-ordinating committee on trade was placed last September, and as well as the central computer with the Eastern Bloc. Any includes concentrators and further delaya could cause pro-.communications subsystems. blems in getting the system up and teated out before the

Olympics. At present even the model of computer has not been Univac has only sold ona othor large aystem to the Soviet Union, on 110611 which will

THE government has decided A Freedom of Information not to introduce a Freedom of Bill, as advocated by verious Information Bill at present, but backbench MPs, would make ell will propose aome reform of the government files and data banka Official Secrets Act, the Prime open to the public, with certain apecified exceptions. Mr Calthe government's reasons for this and the changes envisaged to the controversial Section Two of the Official Secrets Act la expected this week.

make more material public.



NCR rejects voluntary

NCR has rejected the proposal that there ahould be a voluntary Press decretary Jody Powell want ASTMS to represent them (CW, October 27, 1977). The ballot of its staff to see if they Commerce does grant a licance for export of the machine, that it should be the negotioting approval will atill have to be body for all the appropriate. grades in the company and the Advisory, Conclitation and Arbitration Service will carry out a formal ballot. At present ASTMS represanta 800 NCR field engin-

Commenting on the company's refusal to agrea to a volun-tary ballot Jim Mercer, ASTMS' North London divisional officer, said NCR'a decision waa unfortunate and reflected its attitude handle international reaerva-tions for Aeroflot, towards collectiva bargaining for its steff.

Secrets Act reforms

laghan said ha regretted that the government could not introduce such a Bill, but he was gratified that government departments were acting on his auggestion to



the use of trade as a weapon in the fight for more humane treatment of those-within the lisse who are opposed to the

AFTER months of discussions

Meanwhile, the number of redundonclea to be made nt gested at one time.

NCR's Dundec plant between October thia year and March 1979 due to the fall in the number of people needed for making microproceasor bourds (CW, July 6), is now expected to they can either use Control be 85 although 200 was sug- Data's course packages of wife





reading progress

I OWO IT WILL

NOTABLE success in leaching adults to read has been shown an experiment using a bit package for "basic skills" to Control Data's Plate system Several hundred "functionals illiterate" people in the US was given reading training on the online terminals, and gained m uveroge one school years reading level in 12 hours in struction. Similar success vi nlso shown in maths leaching where 115 years' progress we

made in 20 hours. Functional illiterates, d replace a 1901A. whom there are estimated to k

23 million in the US now, and those whose inability to rest comes from lack of teaching rnther than mental handicap. The Basic Skills Learning System, soon to be released

Control Data, is simed to povide computer-aided learning people with this kind of diffe culty in a variety of subject This type of teaching is popular with students, Control Day snys, provides motivation, at reduces drop-out rates.

Plato is o apecial-purper burrents service provided by Control Dato using a networked mainframes in Minneapolis Chicogo, Quebec, and Brusskind special terminals with graphica capability. Custome chuld be the training depart menta of industrial companies or universities or schools, and



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Number 611

Briefing Unigate order goes to Univac

THE battle to win the big Unl-gate order (CW, May 11) has been won by Univac against competition from ICL, which was trying to keep n prostige customer, and IBM. Under the £2.5 million deal Univac Is to supply an 1100/12 to Unigate Foods at Trowbridge, Wilta, where it will replace two ICL 1904 As. The system will include 34 UTS terminal systems which, among other applications, will be used for online program de-

A aecond phase of the project Includes a 90/30 to replace n 1902A and a V77-600, the Univac mini based on Varian designs, to

400 redundant

ABOUT 400 people at the Texas Instruments factory at Bedford are to be made redundant due to the transfer of some discrete component manufacturing to TI's Plymouth factory. Despite the 20% reduction in its workforce Bedford will still be TI's biggest plant in Europe.

Tory policy

SET up by Sir Kelth Joseph eorlier this year (CW, April 20) the Tory party's working group on nformation technology hopes to have its position paper ready by mid-September. Chairman of the group Ian Lloyd, MP for Havant, told Computer Weekly that the group would spend another two or three weeks taking evidence from specialists, inchiding GEC managing director Sir Arnold Weinstock, before writing the report.

BCS moves in

THE British Computar Sociaty la expected to move Into its new andquarters next week, at 13 Mansfield Street, London WIM GBP, just around the corner from ita existing Portland Place centre, Its telephone number ramains the same: 01-637 0471.

Shorter week

THE Post Office Engineering Union says that the Post Office's live per cent planned reduction in inflation-linked telecommunications costs and speeding up of introduction of System X can only be achieved with ita not be forthcoming unless the principle of a shorter working week is conceded. Post Office White Paper - page 48.

Amdahl record

SECOND nuarter figures for Angehl Corp. were again a fecord with pre-tax profit up 83% at \$22.3 million on turnover up 64% at \$73.9 million. The COMPUTER WEEKLY'S INSIDE NEWS THE MICRO CRAFT quartarly dividend hes been. The announ duartarly dividend has a share on the stock, which was split two The announcement of the NEB's Inition venture dominates our first three pages. But there is another lide to the direction of how Sritein keeps a foot in the micro industry race where effect will the interp hove on our home and work life-atyles? In the lotest of our series examining the impact of micros. Fred Lamond suggests that the new ischnology outd, hard the dewn of a return of a new chaft age restoring greative joy to many manufacturing procisies. for one in April

Computacar sold

THE Thomson Organisation, Walch publishes The Times, has: bought the Computacer computer sed match making service or buyers and sellers of new and last cars, from Unileyar Com-puter Services.

Mixed reception for Inmos

nal Enterprise Board's semiconductor venture have not answered all the critics, although there were some positive responses.

THE INMOS PROJECT -PAGE 3 GEC'S PLANS - PAGE 15

lan Lloyd, MP for Havant and chairman of a Tory working party on information technology, commented that the three individuals setting up the new company called inmos, were very competent, well-informed people with a considerable record in the microelectronica

TASS, the Technicol, Admin-

SRC grant

THE Science Research Council's distributed computing pro-ject is likely to sim at etandar-dising networks en the Digital Equipment LSI-11 processor to enceurage co-operative work

enceurage co-operative work among the centres involved.
One of the grants is likely to go to Professor. Peter Kirstein's team in the computer sciences department at University College, Lendon, for work on networks, particularly these based on the X25 protosol. The grant is likely to be spread over thre years and will fund a study of the design and evaluat

the draign and evaluation or high level protocole, including date rates and reliability. Full details of the SRC grants, will be given in mid-August. Tho total svellable money for the projects is £2 million over three years.

mation from data banks in the

US is westing large aums of

public money on transatiantic telephone calls, claims Dr. P. S.

Davison, director of the Scian-tific Documentation Centre in

Dunfermline, Hla MP, Adam

Hunter (Labour) hea aaked the

Civil Service Department for

figures on exactly how much

menual scientific information

retrieval service, hea been a

vocifarous oritic of com-

puterised bibliographic ratrie-

Richard Petritz (left), whe has been named messging director of the company. Deputy managing director is Dr Paul Schroeder (centre), and UK operations will be overseen by John Serren. istrative and Supervisory Sec- that the government's plant to tion of AUEW, welcomed the set up a new company and at the

Thursday, July 27, 1978

venture, but lan Benson, speaking for the union, thought

same time invest £70 million in existing microelectronica com-

panles, was contradictory. "We are concerned that the government does not appear to have a coherent policy on either the industry or on the accial impact uf microelectronica."

Price 18p

The view from the City and from industry, where few people wished to be quoted, was decidedly less favourable.

The fact that the company will lorgely be run from the US was regarded as a major plus, since it would make it easier to acquire the necessary management techniques and international marketing thrust.

There was a fear that Inmos products might be aubsidiaed, reducing, it was suggested, "the technological edge that only free

But far from capitulating to

the argument, the standards

bureau haa strengthened Its

proposal and tightened its

implamentation requirements. suggesting that the only way a

Federal agency could waive the

atonderd would be to obtain

parmission from tha Secretary of

Commerce on the grounda that

their use would cause "a major

adverse economic or operational

Boost for X25, I/O standards

From Hesh Wiener and Cameron Davis in America

THE proposed Implementation of X25 as the protocol for the data network service from the US telecommunications giant AT&T, and a push by the US National Bureau of Standards to enforca, a much-criticised input/output standard as the first mandatory US government Federal Information Processing Standard, have given further impetus to growing efforts to

The X25-based AT&T net-

be Digitel Equipment PDP-11/ 70s using AT&T's UNIX operating system.

work is the long-awaited Advanced Communications Service (CW, July 13) which will

'Wasting large sums on calls to US data banks

vicea, causing o potential RETRIEVAL of acientific infor- val. Recently he claimed that ahowdown in ordera of automation in this field was communicationa-related equipaggravating the current serious. ment. If the FCC approves the ACS proposals, the network is scheduled to go live by the end unemployment of graduates. Hunter esked 13 Parliamentary queations on axpenditure from public funds on telephoned of next year. anguirlea to computara in the US and other countries

Charles Morris, Civil Service Minlater, replied that these costs Dr Davison, who runa a the dapartment's total telecommunications expenditure.

satisfied with this anawer and is turars who say that the pressing the Minister further, atandards mis ht soon bacome,

MASTER AND SERVANT

"Like fire and water, an eparating

system can be a good servent but a bad mester "Is how Bernerd Allon Introduces his main theme in this

week's typically lively round-up of the Ops World, Page 13

The teams for the grand final of the Computactors hetlonwide DP

sports competition have now been decided. And the finalists make an impressive list. Pege 17

FINALISTS

throughout the US: It la exthe node processors will

By proposing X25 in its peti-tion to the Federal Communications Commission, AT&T could be posing a threat to IBM's SDLC-basad network protocol. ACS will also provida US usera, particularly smaller organiaetions, with an alternative to IBM'a communication sarvices which are now deeply commit-ted to the Satellite Business Systems venture.

impact."
The NBS has proposed a package of atandards including

consist of local nodes scattered or already are, obsolete.

Turn to Page 14 Industry observars in the US suggest that user organisations may pausa to reflect on the AT&T offering bafore expan-ding their communications aer-

The move by the NBS to inslat that all US Federal installations. should implement the IBMdealgned I/O atandards comes after a cooling-off period of a debate, with opposition to the munications expenditure. standarda being mounted pri-Hunter has said he is not marily by mainframe manufoc-

Computerview on the NEB Operacous ASTMS

US han opene Soviet door MoD staff grike threat

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APPOINTMENTS: PAGES 20-48

Report from India BM threat to DEC line

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Privacy report for Rees

THE long-awaited report of the Date Pretection Committee is ospected to be delivered to the Home Secretary, Marlyn Race, by the beginning of next week If he then decides to publish it and indications are that he will it will take at least three months befote it is evalishe te the pub

It now seemo probable that the report will be unanimous, without the minerity report that hed been predicted, the committee having mode a special effort to patch up its differences. These have been

leop. There is considerable impatience in the computer in dustry to see the report, be esuae prejects ore being held u until there is some idea of who legislation will be brought in affecting them. Conscious el this, the committee hos taken steps to attempt to bypase the publication delay in Her Majos ty's Stationery Office, which is usually als menths at present.

IBM contract for AMI

FOLLOWING the \$25 million order to intel for 4K memory chips (CW, July 13), IBM has given American Microaysiems Inc a contract for design of a static RAM in AMI's proprietary VMOS technology. VMOS chips ara as fost as any on the market and 40% more compact, with consequent cost aavings, an AMI spokesman in Santa Clara, California, told Computer

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Computer Weekly is seed from of clearing to the following astrophics in the lett and the empt Company directors, company secretaries, president control of the control of t

Computer Workly has a circulation such wick of over \$2,000 lecturing the highest tony sequestra circulation at the United States of the latestational addition, which is published in these a year, has a circulation of year \$4,000.

When the bitching about the NEB should stop

want to see the National Enterprise Board's inmos micro venture fail, particularly those with a political axe to grind against ublic investment and the established firms who would not like to see a successful newcomer enter the market.

In the period between the political leak of the NEB's micro plans (CW, June I) and the nfficial nnnouncement of Inmos (see page 3), the anti-NEB forces were quick on the draw, suggesting that the whale scheme was barking up the wrong 64K trec, that it was a waste of time trying to rhallenge the Japanesa and Americans, that £50 ntillion is Insufficient investment, that It wnuld he nnother waste of government moncy. . . and all that was before the NEB had

announced anything officially. The actual pinna for inmos. however, reveal n breath of level-licaded entreprenourlal fresh air which should be welcnmcd by oll those who are usually so quick to bitch obout Britain because of the country's aupposed mis-spent public weelth (British Leyland, Concord, et oi) and private aloth ("lack of incentives", etc).

Inmos is clearly a riak, but a

no way confined to the company

accountant on the receiving end

of an unpalatable computing in-

voice. The DPM was none too

heppy having to comply with

equests for reelistic coatings.

Countless and often fruitlesa

hours were apent analyzing in

minute detail the true cost of

producing one extra weekly

aales forecast, It was during these axorclass that the DPM

wiahed he woa online to his own

computer rather than to his dosk

Should ovartime rates be cal-

FOCUS

of success; and anccess will mean a lucrative British foothold in one of the most important industries of the fu-

Although the potential rewards are high, the prica of failure would be relatively low - £25 million as an initial investmant, which is peanuts in terms of government expanditure on other industrial projects.

Although the NEB plan created some inItla! bitterness within the Department of industry, whose view is that it is ton late for Britain to get into the mass volume "standard" micro market, Inmos is complementnry to the Dol plans, which are concentrating on the application of microa (CW, July 13).

By master plan or chance, the government (albelt belatedly) now has a number of initiativea covering o apectrum of activities In the micro field. Failure of any ona would not leave the country cntirely nakéd.

But the most impressive and exciting aspect of Inmos is that it is, from the outset, an international operation built on international skills and almed at

Government monay to back American as well as British entrepreneurs (and jobs in the US and possibly the Far East as wall as the UK) might horrify the political Left as much aa the notion of any public inveatment

in Industry horrifies the Right. However, the multinational aspect of Inmos indicates that the venture is based more an a perception of real opportunities rather than being subservient to political theory.

The fact that Britain is providing the venture capital for this type of technological project will be o sign to the world that Britain is a force to be reckoned with in madern industrial life and the rest of the world is likely to be impressed with the NEB's ability to attract men of the calibra of Petritz, Schroeder and Barron; such men are not likely to commit them-

selvea to auch a project lightly.
It is to be hoped that within Britain, inmoa is given the objective backing that it deservea and that, most importantly, it does not become part of a political tug-of-war, with the dislike among some Tories of "government interference" blinding the party to the potential of this exciting industrial initiative.

AS an activity, charging out is not limited to the completion of the operators night shift. It also relates to running a computer installation on a realistic cost The gentle art of charging out Not so very long ago, charging out was all the rage, and was in

company computing activities.

until a more appropriate tima, Herdly aurprisingly, charging out was left out of most DP feaalbility studiea, being replaced by a more phiegmotic approach to costing. If the company requires a new application then it must be of value, regard-

substed with or without holiday qualifications?, Should special enginaering atandby bating cluded? Should the cost of duction costs. switching resources from developing a resi time systam to improving current projects be justified? The results of such studies were usually upsetting

regretting ever getting involved and aeminer, no matter how remote, in diatance and content.

lble especially in large-scale in-atallations. Even after allowing for equipment, sarvice and staffing coata, there could still be 40% of the DP inataliation budget ayallable. This amount la absorbed by such Itams as consumables, telecoma and aervicea and in each nrea there is consid-

management. Any cash balance left dyer from the budgat should be placed to the DP installation preservation fund, and the coal charged out to contingencies.

Ten years ago. COMPUTER WEEKLY

THE first bursen Univer 1108 in the UK yeart into operation for Scioon in London. Three hybrid machines, one H\$7-3 and two H\$7-1s were protected by UK aducational establishments from Scientron. A\$1.3 million order for Honeywell equipment was algred by Lift.

lewdods miss order tirm . This first Argus computer information system to be installed our lade. We want to BOAC's afficient Mew York. A new sport chese with the aid of oom buters, was predicted by Soviet by service clusters was predicted by Soviet can Vistor Glushkov.

Music device wins Philips/CW competition

hoven; and Chiletophii

The responsa in the

atudent section was disap

pointing and no ariging

applications were presented

inmos gets

market competition could

bring." If similar companies

spring up in other countries the

end result might ba a European

"micro-mountain" of unsaleable

British industry might also auffer if it was directed to by

from Iumos rather than from the

free minrket, and there was

feeling that joint ventures with

two or three established US

manufacturers would be a better

Immos has sald that It does we

ponents from anyons elu-

'nithough other companie

might well second source from

Grahnn Meek, clectrosics is

dustry anniyat with stock-

sourcing would halp to built

wide product base on which to

The scope of the venture wat

regorded in the city as unrealis-tic, and tolk of £250 milion in

four to six years was thought to

be unattainable. It was point

out that Intel, which operated in

much more favourable condi-

tions than Inmos foces, only managed to grow from \$4.2 ml

lion in 1970 to \$137 million in

1975. Capital Investment at one

of the US majora will be \$200

million in 1978 alone.

Give for those who Gave

(Incorporated by Royal Charter and registered under the Charles Act 2 840 and Obertsias Act 1960).

A SYNTHESISED music key- sisted of David Bulls, board ins rument which can chairman of the Builer Cor be used far tenching or comnnd Partners consultancy to poeing music, has been van Zanten, planning and judged tha winning entry in npplications angineer with the Philips/Camputer Philips Profassional Recor. Waekly digital cassette ding Department in Flag.

The judges unanimously chase this application, davised by Dr Stephen Castell, Press. of Wickham Bishops, Esaex, ns tha maat original and interauting entry and hove swarded him the prize of nn nil-expanses paid thrae-day Becnuss of this the judge weakand in Hailond for two. decided that no prize would The judging panal can- be awarded.

I WAS reminded the other day of the Cambridge Titan and the Maths Lab, and some of its lovable (in retrospect) folbles. The Titan multi-access system did obvious thinga.

When you came to log in, you pressed tha RETURN key on the terminal and it said: LOGOING IN, and walted for your ID. At this point, unfortunntely, it would often respond with SYS-TEM FULL (Titan wos very popular), and a further LOG-GING IN hod to be elicited by typing RETURN. The only wny to ensure getting in was to keep on trying and hope that you'd be the one Titan looked nt first when another user had logged out.

Impatience was, of course, rife and the RETURN key was intend to second source conoften battered and bashed far more than necessory. Now, when you typed in to Titnn simultaneously with Titan typing out to you, the printout would get muddled ond LOG-GING IN became NOGGING ON, OGLING IN, MUGGING IN, LOBBING ON und ao on. pressed surprise nt this. "Second Uaers wera requested to optimise their machine usage to fund rasearch and developmont," he sald.

allow others a chance, so it was quite just that Titan sent perhaps its bast and aimplest permutation to one computing devotaa who, on hia own admission didn't have to use the computer at that heavily bonked time. "HOGGING IN" it sold to hlm as he leaned nn the RETURN key for the umpteenth

tima. MORAL: Log in, don't hog in The £8 interrupt prize for this entry goas to John Devideon of Cambridge.

> PLEASE WEAR THIS EMBLEM

> > DUBING ..

Wings Appea

control venture supported

To finence the continued deve-lepment of a distributed proceed control system, called MPC 96, the NEB le putting £1.17 million into Nagretti and Zembro of Aytsabury, o firm which specialises in precision instruments and process control

Process

and went back to work at the Stoke,

Coventry plant this week (CW, July 20) did

so because of a lack of support from ASTMS

"We had to go back to work because the

equipment.
The dest will give the NES nearly 30% chare in the com

pany.
The MPC 90, which is bosed on the Intel 9090, cen contro sequencing and data togging is continuous process manufac turing and existing users include ICI, BP, Heinz and the British Suger Corp, The latest version of tho

MCP90 is a radical distributed system with up to 15 procesors. This son he programmed i s high level language called Sanztrol designed for use by process anginaars. Nagretti and Zambro olec

fetigue control ayetem for the Tamado multi-rols military sir-

Japan orders more scanners

EIGHT more EMI brain scanners have been ordered for Japanese hospitals by Toshiba, the Tokyo Shibaura Electric Co, which handles marketing and distribution of the systems in Japan. The CT1010s, valued at over £2 million, are schaduled for delivery by the and of this

THE computer output microfilm lts existing COM users, and will

end of Saptamber. Instead they will be marketed by Agfa Gevaert which signed a diatribution agreemant with Quan-

systems manufactured in the US continue to use Quantor equipby Quantor will no longer be ment in its own COM bureaux. It sold in Europe by NCR after the ia now looking for another COM aystem to market in Europe.

up distributed booking system

It has ordered computer quipment worth E1.75 million



GEC ops accuse ASTMS of 'lack of support' THE 16 sacked operators from GEC who offer of arbitration, the operators finally accepted the company's offer of arbitration accepted on July 14.

operators' P45 cards had been sent to their respective homes, and on the following day According to Hardie, events which octhey received the cards. enrred earlier that week put the operators in The dispute started because the operators

With him as the inmos "foun-

ding fathers" are one of tha best

known figures in the British

eomputer Industry, Computer

Technology founder Iann Bar-

ron, and, representing a major

coup for the new company, Dr.

Paul Schroedar, who joins

Inmos from Mastek, where he

was director of memory design

engineering and is best known

a situation in which they had no choice are unhappy with the company's offer of other than to return to work. Increases of £2, £3, and £4 per week for branch members were not giving us their backing," said John Hardie, a shift supervibranch members, the levy collected from visors respectively. operators, senior operators and shift supersor and the operators' union representative. each member on behalf of the operators was After continually refusing the company's reduced from £2 to 50p.

it is understood that the arbiter is to be NEB transatlantic

establishing the UK end of the

operation and will have general

putar plans of In mos.

responsibility for the microcom-

More key exacultive are ex-

The board of the NEB has

pected to be appninted shortly.

approved the business plan,

which calls for a peak funding of £50 million. The first £25 million

has already bean committed to

the venture, and the provision of

the remainder will depend on the

company's achievements.

micro venture AN American managing director and production facilities in was responsible for establishing Barron will be responsible for

the US and possibly the Far East, a TI research facility in the UK. as well as Britnin, are key featuras of the plans that have been announced for inmos, the National Enterprise Board's venture into the memory and microcomputer market It is likely that the US devc-

lopment facility will be establishad first and that the Far East will be used initially for package assemblies.

The US base will be a small as the designer of the industry prototyps development factory, standards 4K and 16K RAM dewhich could eventually employ about 1,000 staff. It is expecte that about 4,000 jobs in the UK will be created by the mid 1980s. According to stockbrokers Wood Mackenzle, this indicates a turnover target of about \$100 million a year.

The corporate headquarters will be in the UK.

Inmos will aim directly at the volume world markets that are developing for VLSI microcomputers and storage devices manufactured using N-channel MOS process technology.
The much discussed 64K RAM

will not be the only product from the company. Other storage devices such as ROMs and EPROMS are almost certainly on the stocks, along with single chip interocomputers.

inmos managing director will ploneer Dr Richard Petritz, who heiped found Mostek and who was director of semiconductor R&D for Texos Instruments for

Blow to NCR in the COM market

NCR asya that it will cease says that the Quantor recorders will complement the 2200 very marketing Quantor recordera despite what it describaa as its

vice, including software aupport, by the 2200 needs to be pro-modifications and supplies to all coased separately.

Agfa-Gevaert already sells the Calcomp 2200 alphanumerio

"unqualified success" in marketing the Quantor equipment.

NCR adds that it will continue to provide a full technical ser-

Danish travel firm to set



DANISH trayel company, from NCR following a decision to move into distributed procassuch company to operate online reservations for holiday fours, is now seaking to be the first to set up a dacantralised online booking system.

The process of the first to set to reach 1.5 million a year by 1982

In the new system, which replaces a big central CDC system, work, will be handled locally in each Europeen centre with satellite computers which, although operating indepen-dently, will be able to exchange information with one another

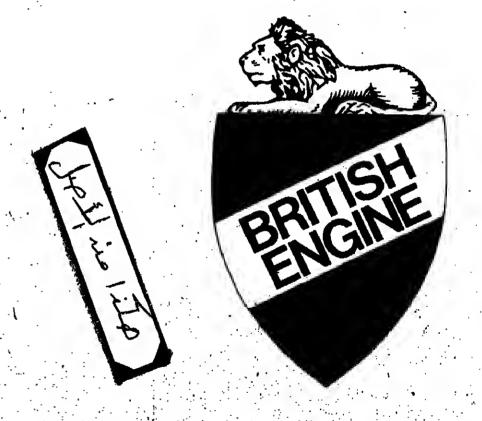
when necessary.
The first part of the network, an NCR Critarion V-8570 aystem, is being instelled et Tjacreborg's headquartera near Espierg, Denmark.

George-Brown on the button

Stapeley House of Nontwich, Cheekirs is the new hoodquorters and Stapeley House of Nontwich, Cheehirs is the new hoodquorters and computer cantre of NMW Computers Ltd, o stockbroking computer bureou. A marqueo in the grounds of the house was the colourful setting for the official opening of the centre and seen here pressing the button that connected NMW's stockbroker clients to the dual ICL 2999 system installed there is Lord Gaorgo-Brown, who was invited by NMW to perform the opening ceremony.

Whi Lord Georga-Brown are the moneging director of NMW, Brion Johnson (left), and the company's chairmon, Brion Bibby, NMW provides occounting and settlement services for its allenra who are equipped with Ferronti terminots linked to the 2990s of Stopolay House. The ICL mochines were ordered lost year (CW, April 28, 1977).

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Immadiate re-eppraisal of all DPM who ballaves it is in ida The DP deportment, while interest, to attend every course

in charging out, raeliatically suspenda the upgrade project

lean of development and pro-Although many costa are fixed the configuration, staff, consumables and accommodation

etc - It is the incidentale, in the fringe areas of computing, director a desk, ha would be vary which tand to blow the carefully quickly charging around in all detapted girl who siternates her accountents team would be the computation of for all concerned.

The user department, faced phone calls between the combination of puter centre and her stallen boy with orders to also all in sight, would shalve the proposed friend or the shift leader who is while enhancement would be repairing in a profitable side-lina is replaced with de-enhancement. On balance, leaving well alone the someony would order and the system maneger who bat management. Any cash balance the system maneger who ba-lieves it is his duty to introduce every known and unknown technical development and

cory into his aystam or tha

own, as well as his company's

DP savings are certainly feas-

erable scope for cost economies.

The art of charging out is not ao much that of revealing but that of concealing. If the real figures arrive on the managing

women who served in the Royal Air Forces have given their health or even their n then dependants are new n need of help. please assest by giving all you can lor an amblem during WINGS WEEK or

JULY 25, 1968

tion tools with nther professionals, with our elients and users, and even with ourselves: so that we can organise our own crestive thinking in o niure rigorous munner. There is such a tool in the

engineering fiold of cast-volue analysis. If was brought into the computer flold by TRWsystems engineers whout 1974, nd was called the Requirements/Properties Matrix. Using this as u practicul inspirniton, I have mode use of the method in a number of cunsulting altuations as a tool for documenting and analysing a system dssign. Everybndy who lius come into eontect with il seems to consider it to be a powerful and useful tool for specifying and qualityinspecting a system design, so i would like to shara some of tha dctalls about it here. The tool is called the

Function/Attribute/ component Table. The "Attributes" are listed verti-cally on the left of n decisiontable like form. The attributes corrospond to well defined system goal orens auch as cost, ellvery date, ease of human use and learning, portability, raliability, atc. Whan necessary, for added detail and measurement precision, these goals can be "exploded" in a root-like manner, and aub-

inbles may be created at will. The "Functiona" are almply any interesting set of functioal viewpoints of the system. They may overlap, they may be motiviated by the interests of any party. Thay may be hardware, software, documentailon or organizationei componenta of the proposed system. You may need to prasent several different viewpoints on aeparate F/A/C/T sheets, to

Communication that's kind

to your pocket

126 character and
terminous cross :
10-30 CPS operator assertation that is at implies
Seat in party on roll place?
True 36 CPS Continues in
Main three in advantable table inside as the
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attributes, be "exploded" for attribute of positive natur more detail. For example PRO- (like reliability) and usually I GRAMS could be detailed into specific programs. The system on more resource ettributes down by means of such explosions, until such a level of deiall is reached that conventionul low levet specification three-dimensional architectutecliniques are appropriate ral druwings, ot the higher (structured design, pseudocode etc). Functions are listed horizuntally across the top of

The CDMPONENTS ure de- equivolents of these in your sign components. These ure unly referred to by a symbolic AF/A/C/Table allows much code in the intoraections be-

ALL MAGNETIC FILES ABLE AS FAR AS POSSIBLE BY AN INDEPENDENT FILE AUDITING PROGRAM.

Componenta may, like attributes ond functiona, be explodad Into more detailed design decisiona, at the appropriata time in the specification process: for exemple "DBAUDIT.PAR: The audit program ahell be parameter driven for selective analysis as to input records, input fields, co-reloted files, depth end type of analysia and output repor-

ting format end volume." design componant is listed on a separate design specifica-tion sheet. High level dealgn components are settled on before proceeding to detailed explosion. But you can exploda, early, any dealgn component which might be particularly interesting to explore early.

A design component la notad in acvoral of the Function/ Attributa intersections. It le satisfy various needs. A func-limpact. Any design component Table to help us mastr tion may, just like the should impact at least one complexity of our task. noted wherever it hes o major

will have some impact on one lanning con take place top (cost, delivery date, project

mannower).
A F/A/C/Table correspond very much to a system of the levels. It also allows you to work your way into "floor plons and fire protection analysia" of your ayatem: or the

simpler completanesa and contwacn Functions ond sistency checking of a design Attributes. A code such as at the early stages, when it is DBAUDIT inlight be used to cheap to correct errors (by refer to a design decision such factor of 10 to 100!) and greater programmer productivity is ensured, not in terms of linea of SHALL BE FULLY AND code but in terms of lines of AUTOMATICALLY AUDITgoals. Less will be rejected by the users and testers for las

moment reworking due to inadequete design. Biologists have their microscopes, astronomera have their telescopea and electronics tachniciana have their oacilioscopes. f feel that the F/A/C/Table is the key to a software system deacription tool which we badly need to communicate about our tech-

nology. I call it e technoscope. I believe that we all need it. for non-trivial projects, in addition to lower-level dasign methods. I believe it is an architect's tool, and that some of ua muat rise above the useful, but limited, horizon of the programmer-bricklayar and become real design engin-eera and architects. To do this we require aimilar tools to those in use in other disci-

I hope we find more techno logy transfers like the F/A/C/ Table to help us maater tha

Moved with success

THE growing auccesa of the Prina fixed-asaet a ccounting system (Software File, April 20)
has been marked by its installation by the Deta Services Division of Conirol Date. The packwork university two aga is evalleble to natwork users weeks ago (Software Fila, July

as a baton, remote passing of price.

Online interactive service.

The dayalopar of Price, incorporating work on the notice of monitors by Professor Lion of monitors by Professor Concur.

AN interactive financial modelling packaga designed and da-veloped in Sweden is being mar-keted by ICL Dataskil for ICL keted by ICL Dataskii for ICL System. Tan equipment. The software, Prosper Ten, provides similar facilities to the existing 1900 and 2903/4 vepsions of Prosper though it is not compatible with these products.

A BRANCH office in Swindon has been opened by the Birmingham based firm, Gould Computer Systems, at 159 Vic-toria Road, Swindon, Wilts Tel-

processor is programmed Demos on the other hand is a tightly coupled system in which all the constituent processors in effect-make up a single computer. It is programmed as one

cation jobs are allocated to parilcular processors at an early stage in the design procesa, according to the function to be performed. Processors would typically be dispersed geographically, each in proximity to the plant equipment it is to con-

operating on networks of

CEGB's Compaas scheme

(CW, July 20) and the NPL's

Demos project (CW, June 29).
A key distinction is that Com-

pass ia a loosely coupled multi-

processor system in which each

PROGRAMMER NOTES

In a Demos system, the corresponding design step is the allocation of operating system taska to particular procaasors. Proceasors would typically be

Thus each processor in a microprocessora and both are Compass system would in suitable for applications such as general hold a complete convert general hold a complete copy of resi-time plant control, there are the operating system, whereas few other similarities between aach Demos processor is generally dedicated to a single operating system tosk.

Demos, Compass:

comparing the nets

These major architacturni differences are accompanied by order of magnitude differences in the volume and rate of dota exchange between processors.

Data exchange in Compass Is essentially restricted to the pnssing of control parameters between related insks. Invisible to the user, aystem mechanisms automatically updote the local dota pool for each process at regular intervala with relevant values extracted from other

The frequency and speed of such exchanges is relatively slow, being governed by the needs of power atation plant. A apecific benefit of loose

coupling in Compass is a degree of systam resilience. Should one processor fail, it will be feasible to revert to local manual control of that function.

Another aignificant feature is new development, also in Cord. that programs can be modified localised gaographically and in a running system. This binne to the Marconi system taaks would be assigned bet- capability is bosed on an interween them according to the active editor and compiler which natural parallelism of the pro- can be run concurrently with

application programs on each

Users of Compass will vin widely in their appreciation of computer systems. In addition tu iin end-user oriented langu-age, the design includes specific protection mechanisms, discriminating - for example - between privilegel and non-privileged users and permitting access to facilities

Together with facilities for dota protection, these mechaisms will make possible the construction of robust systems in which jobs cannot interfere will each others' resources. The system will also include

built-in error tracking to ensure that arror conditions arising from data do not affect plant outputs adversely or give mir leeding results.

Specifically designed to be ily portable, Compass differ in this raspect from Marcon's Locus i6 distributed processis system (CW, August 8, 1974) in which the company designed it own 16-blt hardware module, under the Alp-i project. The utherwise bears a close resetwhich, widely regarded as she

Concurrency requirements rule out Coral for Demos

current Pescal.

process resident.

heduling and job processing,

disc file access, database management, and terminal

may, whare appropriate, be

THE choice of Concurrent duplicated in each processor, Pascal for the NPL'a Damos aystem further emphasisas tha significant diffarence from Compass, which is to be written antirely in Corel 66.

Concurrency raquirementa ruled out the use of Coral as the principal implementation language for Demos, according to a pokesman for the joint NPL-Scicon taam working on tha

> Although Coral was attractive from the point of view of atandards and availability, the abaence of constructions for handling parallelism was a major deficiency, he said.

Tha languaga was also laaa strongly typed than Pascal, making it more difficult to write reliable programa, and it suff-

ered from its relative ege.

The team was, in affect, left with the choice between Concurrent Paacal and Modula as a

Church Straet; Stourbridge, rent Pascal was dayeloped by West Midlands DYS 1LT. Tel: Brinch Hansen at Caltach in the Tony Hosre at Oxford, Concur-system tasks to processors is US. His la still the only Concurrent Pascal compiler in

Drightally daveloped for the EDP-11, the compiler is used in the Demos project to ganerate intermedial a code, which is then interpreted at execution time by the kernel resident in each processor see Fibure 1. ceasor, see Rigure 1

In addition to the interpreter the kernel contains low leval communications routines and device drivers, which could not be written in Pascal. The kernel itaelf is written in Coral, for which the Argus 700F, the project's current hardwere, is specifically designed. pecifically designed. edure call, which is converted to Above the kernel, which is an inter-processor call by the

shake protocol.

passed using a three-way hand-

relpadabla with ao alternative Inter-processa communication.
Is programmed as a simple proc-

software is specific to the processor on which it is running. ment is to implement com-The level Immediately nbnvc, which is referred to as the appliscntter/gather mechanism cation aupport environment, built-in tu tho hardware. The comprises high-level upernting approach would entail splitte systam taaks, written in Cnneuch processor into a pair of processors: one a general purpose machine, the other ! This includes routines for

of RPL is a report generator from existing Cobol or Basic application files. Inbuilt multispecial purpose microcomputer.
If adopted, this architecture vel control breeks, eutomatic would implement all kerne totalling and multiline tabulafunctions, including the intertion are among the facilities preter, in hardwars. The language is also appli-

The allocation of these tasks to particular procassors la per-Demos designers note that the system la particularly intended for applications which divide formed as part of tha system generation (Sysgen). Procesaes neturally into co-oparaling multiplaxed on a single processequential processes. This would include auch ereas as plant and sor, by making more than ona process control, database pro:

munications, and interactive

Specific advantages of Demos

discontinuities in the price

performance curve and that the

high reliability. Although users

processor fall, it is injended that

the system abould be rapidly

terminal services.

Application software	. Sequential Pascat					
Application support environment	Concurrent Pascel					
Kernal (executive)	Corel					
Computing hardwere						
Interconnections'						

Based on Witth's Pascal, and Figure 1. Organization of a Damos processor-

The silocation of operating cessing, word processing essentially atatic.

At the highest level, epplice-tion software, routines ere assigned dynamically to appro-Include the fect that it is assy in expand in the field, that expand afon con be amouth, with as priate processors by the aystem software. Damos currently sup-ports programs written in sequential Pascal, but may later eystem is easily abaptable to different micros. Another notable festure is be extended to support applica-tion programs to Coral end For-

Interconnections between the will not be able to reconfigure a processors, electrically a single system dynamically should one ring highway, are logically a processor fall, it is intended hat bus, Based on executive level the system about be rapidly block transfer axecutive level. block transfers, messages ere

software fit At system generation, alteraative versions will be created which will increase the number

EDITED BY PETER HEWITT

First Euro order for Trax

WHAT to believed to to the first European order for Olgitet Equipment's nawly retessed Trax TP monlior (Software File, June 22) has been placed by Gemma Associatos. Gamma's ctient, Clive Discount, e leading City discount house, changed an existing order

techniques and avellable on

Digital Equipment PDP-11 and

IBM System 3 equipment, has

been launched by a specialist

RPL, Replacement Program-

ming Language, is a auper-set

of the popular Fileteb and FTL6

packages now marketed by the

National Computing Centre. Written by the chief designer

of these products, Tom Barnard,

It will be sold and aupported by

Flietab Support Services, a

compeny which previously con-

consultancy services.

PDP-20 systems.

centreted on Filetab end FTL6

Already running at some

twelve test sitea, tha PDP-11

version, designated RPL(11M), runs under all major operating

systems, including RTII, RSX, RSTS/E, COS350, end CDS500.

It will also run on micro systems

based on the LSI/II, and on

Due to be formally released in about six months, the IBM ver-

sion will be supported on System

32 and System 34 machines in

A fully compiled language, RPL(iiM) offers major advan-

isges both in speed of execution

and speed of program develop-ment over its chief DEC rivals, Basic-Plus and Basic-Plus 2.

Fully compatible with PDP-11

file formats, the most basic use

Puzzler

haa

End.

and-

clubs,

eno.

280

when -

esch

vis]i

sight

isits each square once only.

See page 45 for solution

long.

upon

addition to the System 3.

UK software company.

with Gamma to reep the benefits of the new software. Gamme seld that the main edvantages offered by Trax ere speed end economy o eppticellons davelopment, sulomatic arror racovery feetures and inharent epplication

Decision table-based

addition to instructions for cha-

racter string handling, indirect

addressing and table look-up, it

access methods, including

chained record, hlarsrchicel and

indexed sequential organisation.

At Airftx Industries, an early

site, RPL'a variable length

chained file capability enabled

the development of a complete

Not restricted to batch opera-

ilon, the system offers facilities

for screen handling and data

input validation for online

applications. It accesses

standard DEC operating aystem

mechanisms for locking out

concurrent file update attempts.

peckage is that it includes its

own virtual storage run time

system. Running under the main

operating system, and including

the RPL language compiler, thia

software la reaponsible for

paging user programa in and out of memory and effactively

eliminates restrictions on pro-

memory partition on the PDP-11

gram; alternatively program

tntementa may be entered to an

off-line file for compilation later.

Programs typically begin with a series of dictionary state-

on to file record layouts. A cen-

facilitate the incorporation of

fens

wlih

THIS diagram represents a chessboard with a 64-word massage

inscribed "move by move" on a Knight's Tour, The measaga starts et The and fulshes on 280.

This week's problem is to trace the route, wheraby the Knight

the relevant squares are numbered 1 to 64 in sequence, all eight

firet

200:

bean

and requires 96 disc blocks.

The monitor occupies an 8K

RPL is input at a terminal using free format statementa. A direct input option allows for online syntax checking of a pro-

ments, mapping data names A SYSTEM aoftware package

·KI's

An interesting feature of the

bill of materials processor.

language for PDP, IBM

complex application systems. In into user programs.

supports a variety of disc file required, however, to deal with

Interface for Shadow, Librarian from CAP

ding to installation require-ments. For a typical LSI-11 ays-tem. Filetab Support Services

cites around £1,400. For a targe PDP-11 running under RSTS/E,

the price rises to about £7,000.

The company has already

attrocted worldwide Interest in

the aystem, for which it sees s

In Europe, SPL has for some

months been marketing the

aoftware under licence (Soft-

ware File, March 23). Gamme,

the DEC minicomputer specialist is also using RPL; Gemma

Products Group currently offers

RPL on ita Olympic family of

Filetab Support Services is at

the moment reticent about piena

to merket in the US. It is under-

stood, however, that a number

of US software houses have

made approaches with a view to

negotiating agency agreements.

Filetab Support Services is based at 116 Brompton Road,

London, SW3. Tel: 01-589 4986.

microcomputer systams.

very lerge sales potential.

AN interface between ADR's Cibrarian (system can work online under Shadow. has been developed by Computer Program Task/Master, and Datacomm. Products, the software products arm of A particular benefit of the new Librarian comprehensive archiving capability.

source program retrieval and maintenance relained with the program.

RPL will complle all existing

Filetab and FTL0 source.

Modifications will usually be

differences in dats formats and

file structures, and the company

notes that existing programs

will not make use of all the fea-

Benchmark comparisona

against Basic-Plus have given

impressive results, both in com-

pilation speed and speed of

execution. Compiled RPL pro-

grams are sald to run at least

In about holf the core and to

compile about three times as

suite written for a PDP-11/40

waa reduced to 30 lines when

rewritten in RPL; it aubae-

quently ran in about five

minutea as opposed to 40. A ma-

for contribution is made by an

efficient sort routine, which th

thia case reduced processing

time from 20 minutes to 20

software varies widely accor-

Westinghouse Mangement Sya-

tema. The product, Fast Tran-alent Loadar (FTL), enablea

users to make specified B

translants permanently resident

Improving

The purchase price of the

In one test, a 500 line program

four timea as fast aa Basic-Plus

tures of the new Isnguage.

Online and Altergo's Shadow TP monitor | Librarian already offered interfaces to Cics.

CAP-CPP. CPP has also announced the archiving facility, called Archie, is what CPP latest release of Librarian, which features a describes as "total retention." This means that all changes made to a source program at The new interface means that users of the any time during its life can be permanently

Nastran

THE structural analysis package, Nestran, originally deva-loped under the direction of

Vasa, is to be markeled as part

vorted to run on the new Vax

Sap VI, the letest version of a

known for its simplified user interfees, was developed and is supported by the University of Southern California. Nestran is supported and merketad by MacNeal-Schwendler.

The ennouncement follows Assistance of Assistance in A

Atkins' implementation of Asse for the DECaystom 2020. Asse

else runs on the DECsystem-10 and may be adapted for Vex | Boftware File, May 11).

DEC's Engineering Systems Group has also announced new word processing capabilities for the IAS, Vax/VMS, and Tops-10/20 operating systems.

10/20 operating eyetems. The new facilities are functionally

equivalent to the Document Ex-change utilities already evely-able for R9X11M and RST9/E,

which is instaintly retrievable. Also retained is information regarding the type, date, time,

and level number of each upilate. All of this information is kept within the source program itself, which is subject to the Librarian's compression algorithm. The

eventual size of a program is determined by the number of times it is updated and the number of statements DEC signs up

added durings its life. Archie operates on both disc and lane master files and allows programs to be switched from

archive control to normal processing if required.

CPP notes that the new feathers. ture allows the elimination of all manual source program maintenance activity. It also provides a full program modification mudit trail, including the physical data

records corresponding to each

Nose, is to be marketed as part of its software product range by Digital Equipment Corp. DEC has also signed a marketing contect for Sap Vi.

Soth packages are now available on DECsystem-10 computers and are likely to be converted to the product of the part of the product of **Manchester** office

A BRANCH office in Manchester is to be opened by Systems Designers Ltd, the Surrey-based computer systems consultancy The new base - ot 40-42 Washway Road, Sale, Cheshire - will complement exiating SDL activities in the North-east, not ably a recent £627,000 contract with Britlah Steel at Redcar

Turnkey system

A CDMPLETE turnkey accounting system, worth £130,000, is to be developed by Haven (Computer Services) Ltd for the Netional Supply Corp of Libya (Nasco). The hardware is a 64K CMC Reality system in the Royale version, incorporating the new firmware and Release 3.0 of the operating system.

CORAL 66 on PDP-11 Get the Approved Version!

on to file record layouts. A cen-tral source code library and Copy statement are provided to has been launched in the UK by developed by Digital for the PDP-11 and

> supplier of CORAL 66, willi over a hundred compilers alreedy installed worldwide

n main memory.

Developed in the US by Goal Systems, FTL achieves its effect by reducing contention on the system realdance volume SYSRES) and by freeing transient areas more quickly.

When any transient is to befetched into either the logical

trensiant area or CRT transient araa. FTL: wiil determina whether the phase la resident in storage, if it is, it can be moved directly to the translant area, eliminating the need to read the core image library.

Any number of B-transients

including DDC or CRT transiants, can be supported by the system and can be placed elthar in real or virtual memory. Tha system requires a minimum of one 2K page of real storage in which to hold execution code and a diractory of resident'

To facilitate tuning, the aoft-ware provides statistice of tran-elent loading activity, one detailing references to resident phases, and the other listing the most frequently rafarenced non-resident phases

FTL will normally save betwaan 30 and 120 milliseconds for each transiept load, Thus on a typical load eailmated st 5,000 loads per etical files add up to 260, so the tour is not without theoretical hour, the package can save anyhing from I wo to 10 minutes pe

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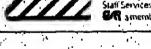
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Angus Ogilvy joins GEC

the UK General Electric Company mard recently is that of Angus Ogflyy, who becomes a non-executive director Rubert Clayton and David Powell become executive

Clayton, GEC's top micro man, has been with the company since 1937 He has been technical director cince 1968, and is also a director of FEC Management. His career has included the managing directorship of GEF. Electronics, 1963-6, and of GEC Research, 1960-68

Michael Pye has hecome managing director of Sinclate Radionies He was technical director of the company from 1973-76, then moved to Gillette in Cambridge, Massachusetts to become director of electronic development, responsible for electronic applionees, clocks and wairlies and smoke detectors.

John Duffy, corporate vice-president of Fairchild in the US, has become general manager of the discrete products group, and is suc-crebet as head of world-wide send-conductor marketing by division virg president Andrew Processini.

Frank Ferrett, formerly technical nomager with the Communications Centre 11d, has become field sales engineer with Microduto

Boat Trip

A boat trip on the Tunmas is being held by AICS, the Association of independent Computer Specialists, or Wed needey, August 9,

The trip starts at 7.00 pm from Tower Plar and returns at about 11.00. Those will be music and doncing end a buffer

Tickota ere E5.00 from AICS Headquarters, & Lelocata Street, London WC2, tal 01-

Peter McPoland has joined Jenson Computer Systems as senior pro-grammer. Previously he was a pro-grammer with Unigete and Rolls Royce. David Haines joins Jenson es He was chairman of the Electrical e traince programmer Engineers' Association 1966-7, and of the IEE Electronics Division. 1968-9, and president of the IEE from 1975-8. He has served on various

government and industry commit-tees for research in electronies.

minager of GEC Power Engineering and assistant managing director of GEC Telecommunications. Ho became directur of industrial planning

in 1969 and menaging director of GEC Diesels in 1971.

throughout Europe for the products of the Hughes divisions at Wey-

liridge and Glenrothes, and will head the Itrossels and Paris uffices. His

most revent jub was as Europeun

milhary and nerospace marketing manager with National Semicae-

iluctor, but most recently he has

heen ullending INSEAD, the

Europena business school et Foe-talueblenu, where he qualified as

Master in Business Administration,

и eenlor systems analyst with Nchonga Consolidated Copper

Mines in Zembin, has become a sys-

tems engineer with Cincom Systems interestional in the UK.

IDPM committee

AT the AGM of the Institute of Data

Processing Managemont, West of London 10 Oxford branch, the Chairman, J. C. Nunn, was elected for

another year. A further two committee members

- Derek Hurrell and Colin Bendall

- were elected; otherwise the mam-

bership of the committee remains

Ian Fleming has become moneger of the Northern software centre of philips Data Systeme, in Manch-ester. He was formerly a systems officer with the Co-operativo Bank.

Robin Hamiltoe-Jones, previously

Stuart Pope, formerly a marketing executive with Computer Systems and Programming, has joined Strand Computer Systems in a similar Powell has been assistant general

Bert Fensome uf NCR has been eppointed district manager of the nmercs and industry division Previously he was vocational services manager with responsibility for systems end programs services and for the morketing espects of commercial application softwere.

George Tannous, previously mer-keting menager for the Middle East and Africa with Memorex in Michel Guy becomes markeling manager for Hughes Microelec-tronics. He will be responsible nal as director with overall responsibility for the management of the company's activities in the Middle East, Africe and India.

John Clifford, Joe Hezelwood end Molcolm Webb, of computer stationery printers inchbrook, heve been oppointed to the board. Clifford, who was formerly works manager, becomes works director sales and commercial menager Hazelwood becomes sales director and Webh, previously financial

Liveware File

WHAT'S THAT RED SAIL

IN THE SUNSET?



THE Computer Tournament for THE Computer fournement for schools hald recently by the industrial computing bureau GMS Computing as part of Shaffield Science and Technology Fair was won by the team from the Hanry Fanshawe-School, Dronfield.

The feams in the final had to find

The tasms in the final had to find the best routing schedule for transporting containers from Shef-field to York. The problems were programmed in Basic by GMS, and the contestants used the IBM Call System to help tham

In our picture above Martie Chatwin, GMS mensging director, presents the GMS Trophy to the winners, (left to right) Mark Ash-ton, Pater Ashforth, Ian Allison, Cale Times.

Bob Monte, until recently vicepresident of field operations with fiel international, has been promoted to executive vice-president of the field

SILICON VALLEY ...

AUGUST 9-9

Computers, communications and tecta-nogy transfer, Jerusalem conference on information Technology. Information Processing Association of Israel/IEEE.

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18: 01-253 4399, ext 347. AUGUST 21-28

national congress. World Organisation of Ganarei Systems and Cyberneiles. Anatordam. Oetella Or J. Rose, College of Technology, Alaekburn, 101: 0254 64321. AUGUST 22-23 Conference on parallel processing.

HOW LONG DID

THE VOYAGE ...

Mooring, VM UK and treland than Group, Maldenhead, Octobs from the Stinson on 01-588 51 (1, ext 2700. AUGUST 23-25

Siggraph 78, 10th conference of the puter graphics and interactive techniques. Association for Computs, Machinery, Atlanta, Georgia, USA. AUGUST 28-SEPTEMBER I Eighth Australian Computer Case ferance, Australien Computer Society

AUGUST 29 Jackson design rechnique, manei ment turorial. Marcue Bromberger, Des of Computer Science, University of Strathelyde. Glasgow. 9.30. Denis her the Continuing Education Office in University, tel: 041-552 4400, ext 1132

TAKE YOU THIS

TIME, BRENDAN!

nanufecturar, Tranadals, has dacilbad the response of these organizations to requests for working cepitel es dismet. Speaking at a lunch to celab-rate Trenedata having passed the ta financial yeer ended Juna 30, Nesis said that it was assist and quicker for Transdets to get a losn Transdate, which is now well ostablished and highly profitable, can increase its overdraft at its

took nine or 10 months to provid the cash avon if it enreed to do so. Transdats builds a range of thermel matrix printer tar thad to get eleen from the ICFC it of which there are now 3,000 would typically take three installed in the UK and on the menthe to the go sheed and Coetinent, and its other main months to the go sheet and Costinent, and its other most integer would probably be product in the CX400 microcor putar system which comes with a floppy disc storogs and can be programmed in Besic. The CX400 is sold by Transdate on an OEM

capital for espending production—aiming for a £2 million turno and marksting. The Dol usuelly—its surrent financial year.

Name change for Info show

'Quicker to get a loan

than from ICFC or Dol

from our local bank

partment of Industry and the in-dualiset and Commercial Finance

Corp. John Neals, managing director of the repidly expending

terminal and microcomputer

£1 million tumovar milestons. In

rom Ita local bank than from the

ICFC or the Department of In-

ocal bank by 60% with no mora

ried to get e loon from the ICFC It

itteched - like ICFC wenting a

hare in the compeny. Nesie sold that the Dol was

really interseted only in londing money for product development

and not in providing working

than a wask's notice, according to Neels. In contrast, if Transdato

that made its debut in April as BED Exhibitions of Wallington, Info 78 (CW, April 13), is to be repeated next year from April 3/8 at the same venue, the West Centre Hotel In London. It will be called Info 79 — the Business Computing, Word Processing above their heads. BED beliaves and Information Handling that more people would have Exhibition and Conference.

This year's show was called

THE exhibition and conference. Conference, and the organiser, Surrey, says that many prospeclive visitors might have identified it with multi-million pound management information aystems and decided that it was visited the show had they realised that the amphasis was very the information Handling and much on the practical systems Management Exhibition and upplicable to smaller businesses. competitors, but it is on a lower rating than any of these contpanles while having a higher

ICL shares.
"We believe that ICL has the

as little as £10,400, including a 16-bit process stock, insurance and HP/credit.

sor and disc Basic operating software, is to System 800 Ltd says that it plans to sell

The processor and memory for System 800 well as selling System 800 to commercial end

are huilt by Electronic Memorics and Mag. users. Under its agreement with EM&M.

System 800 Ltd in the UK has developed a For £10,400 the System 800 purchaser will

32-page in-depth examination of "The market has taken a very

thni ICL's growth was dramati-

companies. ICL's record is very mpressive, yet the shares also stand at a discount of 35% to the market. We consider that this anomaly will be rectified soon and that at around these levels, ICL represents outstanding On ICL's ability to compete

against IBM, the report notes that ICL's foreign turnover has risen from £80 million in 1973 to £212 million last year, giving it second place to IBM in the non-US world market. It also gives a table purporting to show that last year, ICL's sales worldwide grew faster, at 45.2% than any of the major US manufacturers apart from Digital Equipment, which had 43.8% growth. However, It does not point out

cally increased by the inclusion financial strength identified by for the first time of Singer sales the report is that "ICL's return in its total. Even so, the comon capital employed is higher parison is noteworthy in that than that of any of the major Honeywell, number three in the growth stakes, improved naly

about ICL'a technical performance, saying that the 2000 series hardware exhibits "exceptional versatility and power" and that the software utilises "very advanced design con-It also believes that while the

2000 design concepts are valid throughout the 1980s, the US manufacturera will have to undertake very substantial product developments over the next few years-and to substantinte its claim that ICL is strong in basic research, points to the Distributed Array Processor, which it believes will ho a significant product in the future.

A COMMERCIAL hardware/software producing a range of applications packages package called System 800 which will cost to handle jobs like payroll, purchase, sales, biggest System 80ff configuration will still have a 6fK word inemory, but will have 40 Megabytes on disc, a 300 lpm printer and be launched by a new company. System 800 the EM&M processor to systems houses eight VDUs.

System 800 Ltd is a subsidiary of Cattle's Holdings, a Hull-based group with a turnover of nearly £4tt million a year and internetics in the US and have been supplied by System 800 Ltd has the rights to manufacture ests in consumer finance and insurance. EM&M to customers there since last ture the processor in the UK if EM&M stops. Cattle's owns one other computer firm. Hadrian Computer Services which, like System 800, is located at Newcastle, Hadrian disc Basic operating system for the EM&M gcl 64K words of memory, one VDU, a 60 runs a bureau service on an ICL 1903T and processor which can handle multi-tasking chips printer and a five Megabyte cartridge writes applications software for machines by up to four terminuls, but not multi-disc drive, as well as the processor and like the iCL 2903 and the IBM System 3 and programming. The Newcustle firm is now operating software. The applications pack- 32.

Brokers strongly back buying of ICL shares

and specialists in the UK on an OEM basis as

BACKED with evidence that ICL is better placed to compete. with IBM than most of the US mainframe manufacturers, London stockbrokers Laurie. Milibank have come out with a strong recommendation to buy

Ltd of Newcastle-upon-Tyne.

right combination of products, technology, financial strength and management to continuc growing at an ahove average rate, and consider that despite the competition from US companies, ICL has a bright future in data processing," say the brokers at the conclusion of the

> cautious view of iCL for several years, which we feel does not adequately reflect alther ICL's recent successes or future prospects. ICL has grown faater and

"Furthermore, compared to a east majority of UK industrial

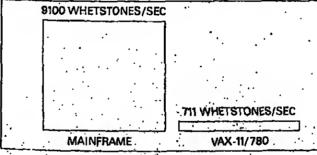
computer manufacturers except The report is bullish on ICL's The report is enthusiastic advanced architecture in the 2900 serics.

A further major source of

"The majority of 2000s are still In their first version," it says "Against this, IBM and the US majors have computer architecture dating from the 60s, which has already been enhanced so much that there is little potentinl for further Improvements. Hence, while ICL can probably double the performance of the 2000 range by enliancements, to get significant improvements, the competitors will need to introduce new products." This analysis ignores the NCR 800 rions, which are rather newer

Digital's VAX-11/780 takes on the world's leading And wins two rounds out of three.

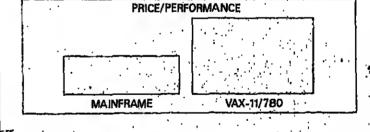
Round one to the 60 bit mainframe: Speed. The mainframe is still the speed champion with 9100 Whetstones per second.



Round two to VAX: Price/Performance. The 32 bit VAX is the world's fastest mini.

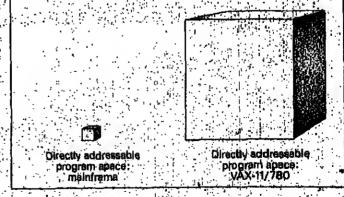
· A VAX system runs 711 double precision Whetstones. That's one twelfth the speed - at one twenty-fifth the cost. A dozen VAX systems could equal the throughput of the mainframe system and you'd still save literally millions of dollars.





Round three to VAX: Program size.

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Danger of no real employment policy

MAY I express unbounded sup-port for I. White's letter (CW, July 6). As a first step we must accept the sermingly inevitable reduction in riuployment levels to a fraction of today's.

However, I do believe that there is not enough emphasis On how "ordinary pcople" will "ensure that the (i.e. micros) henefits will be shared" Governments of all persuasion do not really see this as an imminent problem, in spite of public statements. It is something which will occur outside the lifetime of any one govern-ment and so is readily kept at a

growth economy will have in he abandoned well before the end of the century.
If these two issues were

tackled it may be found that solutions would be mutually ex-

I believe that the whole issue of a workless (or lass work) society regulres mammoth planned social and educational change. Unfortunately, neither political party is remotely equipped to tockle it and, at the moment, one feels that we can only sit and walt for the revolution, whether of the right or the

To: The Editor, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU

Why Scharansky

user or are planning to be, you should .!

talk to Gamma today. We can

support the system and the soft-

quantity orders.

ware. Gamma operates a sub-atential discount policy on

Peculiarities of job ads 'quite amusing'

Engineers. This would seem to THE peculinritles of the English lunguage can be quite nmusing at times; the peculinrities of the be on ambiguous title, and several possibilities spring to job titles given in some of the ads carried in the computer press can be both puzzling ond

Computer Weekly on June 22 carried an ad for Renl Softwure

year in Jeruselem" (a very hot

and dusty town, which I hope to

be in myaelf in August); is cer-

tainly not what I am trying to

defend when I say he should

receive a full amnesty.

Rather I think he is o young.

capable acientist who may make

extensive contributions to the

theory of pattern recognition.

He will not do so in a Soviet

prison. He should be allowed to

emigrate for the good of man-kind. His paychological con-ditioning makes it extremely unlikely that he will ever again

Yet it is the Soviet people who need to learn the lesson of his

Marxism is basically on

empiricel science, and must, as such, ellow free criticism; if that

is damned, an unhealthy situa-

tion arises in which the

sciential - who normally looks

for a safe haven within society

of which he is a member

privileged by education and

opportunities—turns against his own society and becomes a wolf within the fold instead of a prize

sheep.
Even in the UK where critic-

ism is much more free and inwful, developments within the

divorce courts and an over-rapid chenge from a potrierchal sys-tem to what is beginning to

amount to a matrinrchy, have

produced stresses on the under-

signed which meke him feel he

understands Tolye Scharansky

I therefore endorse particu-

ierly the view of Andrew Young, who also has seen e society from

its worse side. It is necessery for

the Soviet leedership to anelyse this universel phenomenon with

the utmost cere.
Hence, I particularly welcome
the criticians of the judgment
by the Italian, French and
British communist parties;

criticism by the Spanish perty

mey be taken for grented. We must not allow over-

enthusiasm by philosophicelly ill-trained members of the KGB

to puah Mankind back to the

KURT METZER

only too well.

dark eges.

feel himself Sovict.

In the Fortran sense, Real is considered a type, as opposed to integer or Complex. But Real con also in the Fortran sense be cither single precision or doubt

The title would have been much cleerer if it had been specified as Double-Precision Reol Software Engineers, or Single-Precision as the case may

If the ad was intended to the Fortran aensa, It can also be nssumed that the company concerned did not want a whole number of applicants (part-lime perhopa?), and that they must for the common good.

There is no doubt that Tolyo S not be complex in nature. has batrayed this ideel; "Next

The word Real can also be seen as opposed to Imaginary in which case it is possible that the regulrement was for software engineera who actually exist and are not some figment of the maginetion. Or perhaps those who know they are antiware engineers and not only think that they are.

If one reods further in the ad, the puzzlement becomes even greater, aince the specification ere is for Real Tima Software Engineera. Perhaps someone could explain to me the significance of this, since all the software engineers that I know consume real time in order to prinduce thair engineering pro-

- ARNE ROHDE Complex Program Engineer

'Offensive photo protest

t FOUND your story headed Model welcome for first 2850 (CW, July 5) and the accompanying photograph, offensive.

And I to ossume that Computer Weekly condones sesist odvertising in the computer industry by publishing this photograph on its front page?

C. M. de la MAHOTIERE (Ms) Deportment of Psychology, Birkback College,

I fell that the photograph was on unusual variation on the "order delivery" picture, summorising both the system used and the application. The use of an attractive femals in a photogroph does not in itself constitute "sexism" and items in our editoriol columns ore not meant to be a guide h

advertisers or vice versa.
The Advertising Standards Authority provides guideline on what is and is not occept able in odvertiaaments. EDITOR.

Guilt-free leisure

I. WHITE (Letters, July 13) is right. We should lipble forward loyfully to the lessening demand for labour. A greater problem than adjusting the economy to meet this change is that of altering attitudes to the work ethic.

It is not easy to persuade millions of people who derive greet self-respect from the importance of their work that thay are really only indulging their own eddler

needs.
To expect labour unions to aid in preparing their members for the change is berhapa being naive, not just because spine of their more active officials get their stoke from "organising" and the power that stems from

it. The less importent work be comes in the life of individuals, the less power will darly a from

A better vehicle for preparing for the new life style is the education bosiness and contrary to the uniona, it stands to gain in significance.

The vast amount of guilt free lesure in the future will enable people to fulfit themselves more completely, and one means it adult education in the wider. adult education in the wides.

sense.

But, as Mr White suggests if peoples liberation comes with out preparation it may done KENTYHYLD

IBM share of world base on the increase

IBM'S share of America's worldwide computer base is on the increase, according to Charles P. Lecht, president of Advanced Computer Techniques. His analysis is based on soon-to-be-published figures from International Data Corp and the work of his company's Technical Analysis Group.

According to Lecht, the volue of US-mode computers installed worldwide Increosed from \$56,000 million in 1976 to \$76,800 million in 1977. Titls increase of \$20,000 million, or more than 37 per cent, includes sales and If-sold value of systems that were jented or leased. The total encompasses general-purpose computer systems, including

large minis and all mainframes.
Of that total, IBM's share of
the 1977 base was more than \$54,000 million, or 71.i per cent. up from 68 per cent in 1976. Honcywell slipped from 9.5 per cent of the US-supplied base to 7.5 per cent, a change that Lecht attributes to the sale of some interest in Bull to the French. Univac held 7.5 per cent of all American computers in 1977, approximately the same share, 7.8 per cent, it had in 1976.

Burroughs built 5.8 per cent of all US machinea installed worldwide, and maintained its share throughout tha two years studied. CDC, however, slipped from a 3.8 per cent share of the base in 1976 to a 3.4 per cent share in 1977. Lecht balleves that the network to which it is contha company made up for any nected.

slippage of its installed hase by increasing its services and other

Trailing the pack, according to ACT's analysis, was NCR, which had 2.3 per cent of the 1977 base, down from 2.8 per cent of the 1976 tigure. Lecht believes NCR will have a brighter future than the figures suggest DEC which sells mostly small systems of relatively low value, maintained its 0.7 per cent share of the computer base.

While the industry's base grew in volue by 37 per cent, inflation, according to Lecht, may account for half of the

growth.

Leeht eautions that the changing definition of computers and the changing mix of goods and services in the business make the 1977 numbers "leas correct than they ever

Active and passive

A NEW serial data analyses from Hewlett-Peckard called the 1640A can be used both actively and passively. When passive, it can be connected to en RS232C (V24) Interface and monitor and record both the transmit and receive deta. When active, it can simulate e computer, modem or terminal, end can interact with

GOVERNMENT COMPUTING

HM Customs and Excise. London

A two-terminel minicomputer systam comprising 64k 16 bit main memory, megnetic tape unit (9 treck NRZ 800 rpi) and malrix printar is required for statistical analysis and oparetionel rasaarch work. The equipment is to be installed as soon ea possible efter mid-Merch, 1979.

Applications for operational requirements quoting CEH / 7 should be eent to Centrel Computer Agency, Room 822 Riverwalk House, 157-161 Millbenk, London SW1P 4RT

Ministry of Defence

Defence Statistics Branch, Whitehall, London

A email computer able to atore and readily access limited quantities of deta end perform edvanced statistical calculations is required for instelletion beginning of Merch,

Applications for operational requirements quoting CEH/5. should be sent to Room B22, Central Computer Agency Riverwalk House, 157-161 Millbank, London SW1P 4RT

Potential Data Control Staff

should attend the Infotech Operations training course Data Control Techniques.

call John Blake for details 0628 35031

infotech Operations Ltd.

OP SPOT

HINT OF THE WEEK

How to find an available disc drive, speedily

THIS week's hint relates to the mounting of discs in the IBM OS/VS environment.

Under nurmal circum. stances, each time the operator wishes to mount a disc volume he has first to use the DIS-PLAY command in order to find out which drives are

This is particularly timecommand several times before mounted.

he finds a drive which is not

To avoid this, use the MOUNT command, but specify device type Instead of the actual address. For exomple:

M 3330,vol={SL,XXXXXXX

The system will then scan its list of 3330 disc drives and send consuming when the system the operator a message giving has many banks of the units for him the address of the drive on he might have to repeat the which the volume is to be

He looks forward to October 1

when new rules will come into

Noise levels—how bad is intolerable?

OPERATIONS staff are often stricted by a tight budget and expected to corry out their that two years appears to be a function in areas where the level very short time. But when you of noise borders on the Intolerhave to work in the aree every able - that is the opinion of en dny It is a considerable period." operator who contacted Op

He becked up his argument force under the Health and with a description of his instal- Safety at Work Act (Op Spot, lation and the conditions of June 8). work the operators have to contend with there,

From that date onwards, provided the staff are members of o "The air-conditioning system is not all it should be, end in en form a safety committee by area measuring about 40ft × 25ft which staff end management can discuss matters relating to the work environment, with a we have three printers, two telelype consoles, a card punch, a tape reader, a tape punch and a view to reaching practical congraph plotter. This makes for en

extremely noisy environment." the matter, and my advice to the According to the operator, a operator is this: shift leeder, a female operator and himself have all suffered Safety Executive and get them to visit your installation. If they from headaches while at work, and he attributes this to the enhink the conditions of work are

The management is fully intolerable, they will take the aware of the operators' feelings appropriate action. about the matter. On one occasion a noise-measurement test was carried out and the opera-tors were assured that the level of noise was not a health hazard.

conditioning system and he seys
that it "resulted in n considerable improvement".

But the noise from tha
peripherals is still a great problem and the operators are to

lobby for another test to be carrled out. Next time they will insist on seeing its results.

· Ha attributes the manage. ment's rejuctance to take action to the fact that the computer is due to be relocated to a naw area in a couple of years' time.

He continued; "I appreciate that the management is re-

Disillusioned operator

going on a long holiday be-ceuse I'm tired of this typa of employment in all tta espects."

So writes an NCR Century. operator with over four years' experience", who in e years experience, who in e-brief letter expresses hie dis-illusionment with operating, particularly contract work. He turned to contract operating after trying unsuc-ceasfully to transfer from

He goes on to say that ha He goes on to say that ha is "sick of being treated es the odd-job men", pointing to the fact that contract staff tend to get saddled with the tedrous and less pleasant tasks of operations.

He reminds us of the fact that contractors must be prepared to move about the country and "work all sorts of shifts and long hours."

A good servant, a bad master

LIKE fire and water, an operating system can be a good servant but a bad master.

Indeed, it will either dictate the manner in which the console operator runs his system or. alternatively, be used by him in order to optimise throughput and make his task as easy as

Someone who knows how to use his operating system's facil-itles will make operating seem simple, while another who is less technically aware will often give the impression that the job is extremely difficult and harss-

Let us consider a situation, in the IBM OS/VS environment, in which the operator might use that system's commands to monipulate the job input and output queues to his advontage.

Supposing that out of o shift comprising three operators, one is absent through sickness and another is et junch. The operator at the master console is therefore the only person in the computer room, end es auch is reaponsible for all peripherels in addition to the console work.

Of coursa the operating syatem has no way of knowing about our unfortunate friend's predicament, and so it continues initiate jobs, call for tapes and discs to be mounted and request that the printers be supplied with the appropriete stationery.

Before long he will find him-

I have consulted an expert on self running between the con-Contact your local Health and sofe end the peripherala and on returning finding more system

equests, and so it goes on. What should he do in this situetion? Let's disregard the fact that he should complain to his opern-

system from taking any more jobs from the input queue, and o prevent it from transferring dota from the output queue to Secondly, he should satisfy oil

shortage anyway, and look at a

couple of IBM OS/VS com-

mands which he could use to

great effect: the HOLD and RELEASE commands.

So what's new anyway? many

of you IBM operators may ask

Well, I must emphosise that the

hallmark of a gond operator is

not what he knows in theory

but how and when he puts that

Firstly, then, he must use the

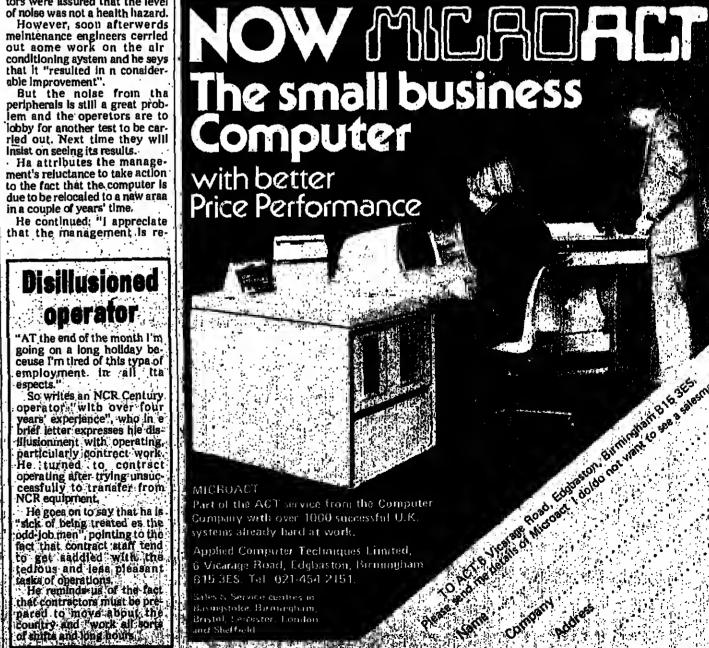
HOLD commond to stop the

knowledge Into practice.

the system requests for tape and disc mounts, in order to keep everything "ticking over". For the time balling he should ignore any requests for stationery Next, he must release all input

queues which, according to in-stalletion standerds, will not request any tapes or discs to be sider the jobs which will require volumes to be mounted, and reorganise the queues ensuring thot jobs using the same media will run in sequence or concurrently. After ensuring that all necessary discs are mounted and that the tapes are at hend, he ahould release the remaining

As far as the printers are concerned, he should check that one or two have plain paper on them, put queues. Output requiring rinted stationery should be preprinted stationery shou held until help is overlable.



should be set free To contemplate such a fright-The most likely result is that ening possibility leads me to a single conclusion. There is a no real policy will be adopted and we will find that by 1990 we moral duty on all computer perhave 15-20 million unemployed sonnel to woge a compaign to get the government (whoever it may be) to adopt policies to The Indictment against Schaand/or a revolution on nur sent a personal telegram to Pre-sident Brezhnev. Of ell stateransky is on the ground of betrayal of his nation. As I have Even assuming that the next cnmbot the above scensrios, and ments expressed so far, the a Czech mother, I fully underto do it along the lines suggested by I. White, We moy find that wa government can be persuaded to atand how grave such a charge is nearest to my point of view is take action there are two critical that of Andrew Young, whom I to a Slav people. issues which I believe would be are not as brave as Anotoly excluded: I. What basis for the I think the present Soviet fundamental unit and roal hero Scharonsky and I hope we never dissidents may well prove the salvation of the Soviet Union, that they are a natural development of Soviet society, but its distribution of wealth could and should be adopted by the intro-MIKE LYNN doction of a nutional dividend? Holdars Hill Road, 2. It will be necessery to accept London, NW7. COBOL on IBM SERIES/1 today? Why walf for both COBOL and a more powerful operating system? They are here now from Gamma. COS/1, a sophisticated operating system for IBM Series/1 which supports COBOL is now available from GOS/1 *SUPPORTS VIRTUAL STORAGE* COS/1 Requires no additional expenditure on hardware-the most effective offering on Series/1. COS/1 Runs under CPS (Control Program Support) and is not limited to RPS (Real-Time Programming System). COS/1 Does not require LINK EDIT: COS/1 is already in widespread use in the USA, with more installational taking place every day. Whether you are already a Series/1

GANNA MESALE ROUTE OF SERVICE STATES AND CORD.

GANNA MESALE RELIGION SERVICES AND CORD.

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A SERVICE SE

Edited by Martin Banks

Series to help managers

hy the National Computing Coulte, Called Talking Points, the tapes are accompanied by illustrations, diagrams, and selfchecking questions, and each session takes about 45 minutes. introducing microcomputers, computer autput to microfilm.

datalizace organisation, and computer security. Six topics

he autounced in the UK this year by Redifon Telecommunicalnus Data Communicathous Division Is the 2400 LSL made by Penril Corp in the US. The 2400 LSI conforms to CCITT V26 und V26 his, and has Post Office approval. The modern includes a test pattern generatur and unalogue and digital lonk-back checks. It sells for £562.

CAD symposium

A SYMPOSIUM nn Computer Alded Design for digital circuits anii systems, sponsored by the EEC Commission, will be held in Brussels from November 27-29, 1978. Results of a study carried out on behalf of the Community by Saget will be presented and spenkers from the US. Japan and Europe will give papers. Cost will be \$170.

DG profits up 37%

IN the 12 weeks to June 3, 1978, Data General made a pre-tax profit of \$17.9 million, up 37% on the same period last year.

Tallored to fit

UNDER o contract worth well over £300,000, Anker Data Systenis is aupplying Burtona, the talloring group, with 441 elac-tronic cash registers for Burtona ahups all over the UK. The rag-isters are ADS-Omron 573 units.

Banking on a profit NEW YORK Times Information Bank, tha online retrieval aer-

vica for news and current affairs (CW, March 2) lost \$900,000 in operations last year, This is an improvement over tha 1976 loss of \$1,600,000. The paper says it is confident that the bank will "ultimately" turn in a profit.

£100,000 contracts

AIR-conditioning systems supplier, Wright Air Conditioning (Scotland), has sacured two Holines Engineering Services of Middlesex, which supplies pipes and valves. The Laval 6 based eystems will handle jobs like slow control of the control of t contracts worth £100,000. The first is with Aberdoen District Council and the other with A. R. Finding, domestic hardwara wholesalars of Glasgow. purchase ledger and sales order

ike e first-rate software support, fast servicing

and meeting your critical neth requirements.

A SURHES of talks on ambio carsettes to help managers keep up-to-date with developments in computing has been introduced Topics of the first tape will be: Penril modem FIRST of a series of modems to

Prestal comes to the aid of student job-hupters.

ACCURATE colour matching is

vital to the textile and paint

industries, and Instrument Sys-

tems Group of IBM has intro-

duced two systems which use

spectrophotomatry linked to

igital computing techniques. The 7841 is for textiles, and the

7842 for coatings such as paint.

Both include a apectropho-

charge display, two floppy disc units, a key board and a printer. The 7842 and the basic 7841 Model 2D cost £42,960, with

three additional models of 7841

ranging up to £49,000. These are designed for complex taxtile

The processor, with 36k af RAM, in the colour analysers is

tho aame micro as used in the 3790 tarminal, and user pro-gramacan be written in Basic.

Level 6 based

COMMERCIAL systems confi

gured around the Honeywall Level 6 minicomputers ara being supplied by EMS Consultants of

Newcastla, Staffs, to two first tima users. These are plano keyboard manufecturor Herrburgar

Brooks of Nottingham, and

ilke slock control, salea analysis,

systems

colour analysis applications.

systems for paints and textiles

The display is a Digivue gas discharge panel using a 512 by 512 matrix bought in from Owens Illinais of Toleda, Ohio.

the market are used in conjunc-

tion with computers, but IBM

claima that its systems offer ease

Other apectraphatomaters on

Prestel service for young job-hunters The viewdata terminal is a modified television set cannected in a mindem. The user by the Cureerdata staff.

computer at Martlesham Heath.

where of the many thousands of

pages of text available, 3,000 have been allocated to Curecr-

Pnges nre selected with n

numeric keypnd, using a "tree"

indexing system; ench pnge

shows a list of the pages that can

be selected next, as one goes

down the tree to get more detail.

Each page cnn hold 22 lines of

There are only 16 ports on the

Prestel system at present, so

usage is limited. A new com-

puter in Lundon is being added

to the system in August when the number of ports will go up to

200. Cureerdata will then be in a

position to provide terminals to

other universities, and eventu-

ully expand the system to cover

Collecting

weather

data

TWO Digital Equipment PDF 11/05a are being used by EMI Electronics to collect, store and

process oceanographic and process oceanographic and mateorological data relayed to them by the UK National Detailor in the South Western Approaches, about 150 miles from Land East 150 miles

Developed by the Saelsk Group of Companies, the busy is continuously collecting the date for the banefit of the

offshore off and gas industry, and transmits the information to

the land via a high-integrit

tetametry link. Dale will also be made available to the UK

Metaorological Offica to assist in the complication of aynoptic weather forecasts for the UK.

ones for nn I/O channel-level

interface, an accompanying power-control interface and for

the first time, a propased

channel-level operational spacification for magnatic tape. This package, which the NBS hopes will be difficult to tear

apart, is aimed ot saving as-

much as \$55 million over the

next five years in "trimming the

cost of buying new computer peripherel equipment."
The NBS move confirms the

prediction of a leading US sena-

tor, Fritz Hollings, who has said that the NBS is the focal point of

the Government's five year plan to "achieve much closer links

batween government procure-

ment and the meeting of

Hawker Siddeley

£135,000 order

from Lands End.

US boost

• From front paga

for X25

non-graduate jabs.

tion of Prestel has been launched: an online jab advertlsing service for graduate recruitment. New Opportunity Preas, which runs the service and calls it Careerdata, has already installed 14 viewdata terminala in university and palytechnic careera offices, for tudents to use in looking for job

FOURTEEN VIEWDATA TERMINALS INSTALLED IN CAREERS OFFICES

The service will be completely free to the jab-huntera, being paid for by the firms whose jobs are advertised. Only the charge far the telephane call will have ta be paid for by the university; the terminal is provided free, tagether with a user number that allows access only to Carcerdata, excluding other IBM introduces colour matching

Systema Group was aet up in

lished to sell the technology de-

copy, 39 characters wide. Joba on Careerdatn can be accessed by three indexes: employer name, type of work, and application. Each of these has an alphabetical index that the user works his way through. An employer is allocated as many pages as it chooses to pay for, and can arrange these pages in any way it likes, with jobs grouped geographically, for instance, or by type of work.

There is a standing charge of £150 a year, plus £20 for each frame entered, and ½p every time a frame is acceased. This duced since the UK Instrument last charge is the Post Office's, and means that if 1,000 students January, and is an extension of look at five frames each over the the US group which was estabcourse of a year, the aubsequent charge will be £25.

The system has the distinct advantage of immediacy, in that yacancles can be online within hours of arising, and also can be removed the moment a job is

velaped within IBM for its own use. The techniques were deveof use, sensitivity to dark colloped on an IBM 1130 ta measure aurs, and ability to take account the thickness of thin-film of underlying colour.

GRAPHWAREI Euro: made e name for * Synchronous plotting on-line accomplished in ayrohronous listing at maximum mechine speeds. * High quality plotting neatness with speed elimination banding of Bray bars. * Hoducad time and memory requirements—impre EPU line and storage available for your plotting programmers. Sand for nutther relates today. of quality computerbesed electronic instru-monts expanded into the GRAPHWARE compular market Walbrought with us those qualities that givery computer been neads, as pecially these days like a first-rate software

Is a mildroprogrammed controller dedicated controller dedicated controller dedicated controller dedicated controller dedicated controller dedicated vertical attention as the property of the controller of performed in the controller appropriate of the controller appropriate in the controller appropriate of the controller appropriate of

QUALIFIED TO HELP YOU QUICKLY



The shape of galaxies

Heights, New York, have been using a 379/168 to lest a new theory attent the formation of spiral galaxies. Computer simulations of the palaxy showing that the theory store that shape of galaxies is brought about by the redistribution of matter in large numbers of supernove explosions and ax our photograph shows, the patterns in the ourrent saue of the Astrophotograph shows the patterns in the ourrent saue of the Astrophotograph shows the patterns in the ourrent saue of the Astrophotograph shows the patterns in the ourrent saue of the Astrophotograph shows the patterns in the ourrent saue of the Astrophotograph of the palacy in the theory over a simespan, of the palacy the theory over a simespan, of mort phenomeron in our own and patterns galaxies."

Add-on board for Pet

A SINGLE add-on board may memory space and with soon be available from Common memory paylitioning allows an other has extends the memory expected to be cur in addition to provides 31 K bytes of usors machine.

THREE BOK Burroughs B&I4 Hawker Siddeley Power Enginearing; one for each of its main UK offices.

vest made and superimposed on a present-day photograph of the palaxy, showing that the theory has a lot going for it.

Or Humberto Gerots and Dr Philip Selden report their results in the ourrent issue of the Astrophysical Journal. Level 64 picked for

ease of upgrading INSURANCE company Hearts of Oak Bahefit of Leicester has replaced its six-year old Honey well 1015 with a madium-scale Level 64/30 meinframe, cling aase of conversion and field upgradability in the future as reasons for its choice.

Hame change:

SUNNYVALE BASED Amcorp Inc. a subsidiary of Datapoint Corp of San Antonio, Texas, is to be rehapied it Datapoint Peripheral Products Dvision

MICRO NEWS

Ferranti may enter high-end market

FIRST samples of the new Fer-ranti multiply and divide circuit for its F100-L 16-bit microprocessar are expected to be available by the end of this year, and the development could mark the start of a significant expansion programme for the company in the high end of the

market. Far the device, in essence a 16-bit slice processor, will be a fast device, with a total elapsed time between aensing an instruction and completing the task, in the range of 7-13 microseconds. Its capabilities will include adding two 16-bit numbers to produce a 32-bit number, and dividing a 32-bit number to produce a 16-bit

In its current form the device is not cascadable, ie it will nat be possible to contact two or more together to produce longer word-length processors in the manner of bit slice devicea lika the AMD 2900 series.

Ferranti, however, Is considering such a development for the future. It probably would be

type processors, and by using the company's uncommitted ingle array technology, it feels it will be able to develop rapidly the necessary support circuitry.

An obvious early market for such a move undoubtedly would be the company's own Argus range of minicomputers, which already utilise the AMD part.

There is also the possibility that the basis of the multiply/ divide circuit will be incorporated in a revised version of the F100-L itself. The current pro-cessor uses a 16-bit seriol function unit. The decision to use this approach was taken by the company as a trade-off between ita smaller aize, but slower operating speed, which is largely compensated by the fact that the unit uses fast blpolar techno-

logy. Such a development would produca a 16-bit parallel version of the processor that cauld offer o doubling of proceasing throughput without any tech-nological development.

no plana for the group to enter

the field of hardware design as

The work currently being

carried out by the group in-

cludes the development of a

system to control the ordering

nal denots of the company.

group la working on is for using

inicros for data collection pur

poses for a stock-recording lin-

Grand Met sets up applications workshop

THE diversity of potential appli-cations for microsystems within the Grand Metropolitan group of campanies has prompted it to set up a micro "workshop" to develop them. Headed by Ian Fitzpatrick, the

warkshap comprisas the five man Planning and Research Group, part of the Technical Division of Grand Metropolitan Informatian Processing. It is based at GRIP'a Uxbridge bureau, where it has access to an Itel AS/5 and an ICL 1903 for systems development work. The ICL machine is to be replaced in October with an IBM 3031.

Though, in the future, it may consider autside contracts, the group's current activities ore solely concerned with applicationa within Grand Met. These revolve around producing aoftware implementations that run on readily available microcom-putar hardware, the current

ear program that is already in Low power standby ROM

A NEW 64K bit read only memory has been introduced by. Mostak that offers a low power standby mode of oparation which is said to increasa both device and system reliability.

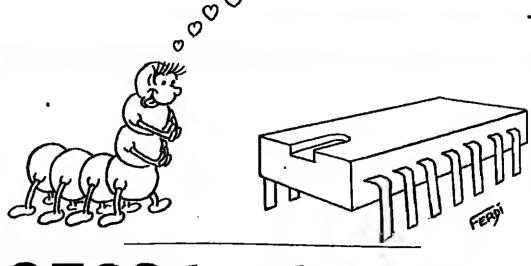
memory requires only a single five volt power supply. It is or-ganised as BK by 8 bits and offars a maximum access time of 250

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GECS to stay out of any US deal

Turnover for the operation is

thought to be about £4 million

this year, a 40% growth over last

year, and the same growth rate is being aimed at for the future,

to effectively double the size of

To help this growth along, the company has spent around £1

million over the last year in ex-

panding its production facilities,

with new computer-alded design

equipment, teat equipment and photomaak production equip-

in addition, R&D expeoditure

the company every two years.

WHICHEVER US semiconductor manufacturer the GEC efforts to establish a joint venture operation, the move will not affect the position of GEC Samiconductors as the company's lead house for customdesigned LSI circults. This waa made clear last week

by Chris Turner, director and eneral manager of the company. There are no plana for GECS to enter the standard South Weat Tech 6800, There are product market, where it accepts the fact that it would be possible for It to compete. But the GEC group was obviously interested in the opportunities, and was therefore looking of the possibility of participation with an established company.

and stock of milk delivery Although there is no formal roundsmen for a dairy products corporate policy decision by GEC, Turner implied that any company within the group. Based on un SWTPC system joint venture operation would almost certainly have a UK with two mini floppy drives, it would be installed in the regionanufacturing operation.

This, according to Turner, was because it would be unlikely for At an early stage of eveluntion Is an order entry system that would be involved in a compeny GEC to want to inveat in US technology and leave that techexporting alchoholic drinks, while another development tha nology aolely in the US.

Although the company is not allort of financial resourcea, starting a "greenfiald" operation to compete in more than one product area for the world standards market would take a great daal of money over a considerable period of time.

The one company that GEC has been known to be talking to, Fairchild Semicooductor, has no existing UK production fecility or any European facility eithar. The prospect of collaboration with GEC is therefore obviously tempting, in that it might offer Fairchlid the chance to establish a Europeao base. But, considering the costs in-

volved - there would be little change out of £100 million in all oility - GEC's reticence in commeniing on just which ably opens the way for specula-tion on other possible candidatas.

These will obviously includa the US manufacturers with UK operations, such as Motorola, National Semiconductor, Texas Instruments and General Inatruments and General In-atrumant Microelectronics, all of which are wall entrenched in the mass merkat. The first three would possibly be too big for even GEC to swallow easily. GIM however, is smaller, and complements GECS in several areaa in that it has considerat expertise in custom design work and is a competitor in the telecommidications market for auch devices as push-button

telephone dialfer chips.
A apokesman for GIM however, has categorically danied any talks heving taken place with GEC.

GEC itself is now operating

this year. Another potential boost to ita growth rate plana ia the introduction of the Cellmos This is based on CAD techni-

aues developed for use with 4000 series CMOS elrcults. Thase use a standard sat of "cell" structurea to accommodate the various functions required, held in a library on a comouter. This ceil structure allows design engineers to call up the required cells by reference number, rather than "re-inventing the wheei" each time.

is running at around £750,000 for

Computer retailing shop for Liverpool

THE computer retailing trend is gathering pace, with the news that another shop is to be opened shortly, this time in

Opening at the end of this month, at 25 Brunswick Street, Liverpool, Microdigital ia currently atocking up a wide range of products that fall into three main categories: dedicated task systems, general purpose microcomputers and auppart items.

In the first category will be such items as micro-based door bell systems and microcomputer games systems. In the second, Microdigital will be selling kits from Science of Cambridge and Lynx, handling the Mk 14 and Nascom I respectively. On the systems side it will hove Apple Il's the Caau general purpose aystem, and the Star Interactive booking system, running on Mael 2000s. Support Itama will Include

packaged auftware from a variety of sources, including programs produced in-house. litarature and assembly equip-

The company is being run by Bruce Everiss and his brother Alan, whose main task will be to build all the kit demonstrate models. This way they hope to face and overcoma the common assembly problems.

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How India is keeping abreast in DP services

services company in India must he Tata Consultancy Services of

Part of the giant \$2,000 million a year this ennglomerate. which makes everything from soap to trucks, TCS has a close working association with Burroughs, and has formed a joint munufneturing and snftware enmpany, Tath Burroughs, in which each has a 50% holding. TCS is run by Fogir Kohli, a

soft-spoken, hummrous man from the North-West Frantler. whn exhibits all the best chometeristics of the sturdy independent tribal people from that ununtalnous area

professionally-run empoter its lurnover has grown from services company in India must \$350,000 in 1966 to \$5 million in 1977, \$1.8 million of it earned

Equipped with a Burroughs B6748 with 512K-bytes of store, shortly to be upgroded to 1.6 Megabytes, a B1728 with 192Kbytes, an ICL 1903 and two IBM 140is, it is not surprising that TCS has abundant experience of conversion. It claims that 100 man-yeara of effort has gone into rewriting ICL, IBM and Univoe programs for the Bur-

TCS is also heavily involved in ness pockoges for the Burroughs B80 small business computer. TCS employs 250 computer Inventory, receivables, payablea professionals, all with ex-

requirements, and a TCS team ia doing the work in the UK.

TCS insists that it is in no way responsible for the latenesa o B80 software, and Indeed the work done by the company is very highly spoken of within Burroughs has brought in

TCS as subcontractors for many overseas projects, including derelopment of a hospital real time Information system and a banking information systam in the US, conversion of 1,000 370/145 Cobol programs to 86700 for the City of Detroit, Burroughs' home in Michigan, and an IBM to Burroughs conversion for the Auckland Savings Bank in New

A major convarsion job was

Container Terminus in Rotterdam, where it was necesaary to convert 200 programs written in Univac 9400 aasembly language

into Cobol to run on a B3700. The project was managed in Bombay, took five man-years of effort, and most of the work was done on a B4771 installed in

Some system software, mainly Cobol and Algol preprocessors company's forte ia clearly in coat-effective conversion.

The rates chorged for a senior man are \$24,000 to \$30,000 a year overseas, with travelling and living costs extra, and \$15,000 to \$16,000 a year in India, Including

The B0700 will greatly expand

the company is not yet in n position to use the machine to tni Research for the new part. anything like Its full extent. A United Nations Development few terminals are attuched, but Programme-funded National the overwhelming workload is Centre for Software Develop-ment and Computing Technistill batch, Improvements in the communication facilities in Bombay, the addition of more quea, DEC has picked up a terminals and the addition of the number of other orders or letters extra memory abould enable of intent for large systems. These include a DECsystem TCS to make much more effective use of the machine. 1090 for the Institute of Science

in Bangalore, and 1020s for

Chandigarh and Roorkee Uni-

PDP-IIs in India, about half of

them used in classified military

blems is that the most advanced

upplications tend to be done by

organisotions like tha armed

forces and the police; they are

done in-house, and the experlise

gained seldom filters through to

DEC's agent in India is Hindi-

tron Computer Systems and

Consultants of Bombay, Hindi-

tron is o small company with 20

hardware and 20 software

specialists, providing services on

its own PDP-11/34, and also

acting as agent for Textronly

DEC in the US, Hindiron pro-

vides maintenance aervices.

troining on DEC operating sys-tems, writes software for DEC

mochines, and is keen to do

conversion work, particularly

Cohol and Fortron, it claims that

it can have the right man on the

spot anywhere in the world in 48

hours, and that its rates are

one-third of what DEC would

Annther small but enter prising company is Ravi and Ashok Enterprises of Pune

(formerly Ponna), Maharashira. Royl ond Ashok has forged a

link with Dato General, and is in

tha process of importing its pwn

Eclipse C330 which is to have 182K-words of store and will

in order to get a licance lo

import the machine, Ravi and Ashok has had to agree with the

government to export 100% of

he value of the machine within

five years. If it fails to do so it

will be fined double tha shortfall.

The company has made a good start, being owarded contracts by Data General to sont vart RPG and Cobol programs.

from IBM machines to run on

Data Genaral minis. Half of its business is data entry, and it is

alao doing media conversion for :

US customars, it employs 30 people, 14 of them computer

Specialising in software for tha petrolcum industry. Data Electronica Combine of Delhi

amploya six consultants, and lis

restonais:

support 12 VDUs.

With several people trained by

the murketplace.

applicationa; one of the pro

versities.

TIM PALMER REPORTS FROM BOMBAY

Continuing his review of Indian ware houses, notably Tata Con.

Computing 1978, Tim Palmer sultancy Services, beat known for

this week takes e look at some of its association with Burroughe,

India's leading bureoux and soft- revealed in CW four years ago.

The association with Tota and the agreement to manufacture sub-assemblies for the B80 for export have led the government to look favourably on Burroughs, and since 1973, the company has acquired o strong nucleus of machines in India, As well as the machines at Tata. there is a B6738 at the Calcutta Regional Computing Centre, o B1726 at the State Bunk of Indin, and a B477t at the Agricultural

The legendory IBM 1401 ut Dunlop (CW, June 8, 1974) is finally to be penaloned off and replaced with a B60t1 - the programs have aiready been converted on the 6738 - and Bokoro Steel is also to gat o 6811.

The latest entront in the mainframe atakes in indio is Univac, which acquired an indian distributor when It bought Varian Detn Machines ast year. Varian V77 minis were morkated in India by Operations Rasearch Group Borodo, and Univac has successfully extended the sgreement to cover

Univac's star is very much in the ascendant, and four 1100s should be installed in india within a year: one eoch for Air india and the internal Indian Airlinas reservotions systems, and two for Bharot Heavy Elec-

ORG has 200 employees on the computer side, 130 of tham trained in computer science. It installad two V77-200 minis in India before Univac orrived on the scene; and wrote several deces of software for them, inluding an IBM 1401 emulator, a linear programming package and a GASP-iV implamentation.

Work under way includes a text editor, a statistical analysis package and a general purpose

TCS Insists that It is In no way responsible for the lateness of B80 software, and Indeed the work done by the DY IS VAL highly spoken of within Burroughs.

main achievement was the development of software to simulate oil well performance for the Indian Oil and Notural Gal simulation aystem, all to run under the V77 Vortex operating system, and two modules for Univer's USAS standard airline Commission. The systam is designed to predict at what point system. These consist of a P1024 protocol handler and a check-in

protocol handler and a check in module.

ORG staff have also worked dr a Univac 1106 installation in Madrid. The company has been exporting software, much of It to the Soviet Union for two years, and did 30% of its business abroad last year discussions are under way with Univac on possible assembly of V77 minis in for a saked the company to devaluation of a safeware package for the lodia.

ORG is also working with the flow of oil, mean of the water cone which builds up in an oil well will begin to interfer with the water cone which builds up in an oil well will begin to interfer with the water cone which builds up in an oil well will begin to interfer with the flow of oil, mean of the water cone which builds up in an oil well will begin to interfer with the water cone which builds up in an oil well will begin to interfer with the water cone which builds up in an oil well will begin to interfer with the water cone which builds up in an oil well will begin to interfer with the water cone which builds up in an oil well will begin to interfer with the water cone with the water cone which builds up in an oil well will begin to interfer with the water cone with the water cone which builds up in an oil well will begin to interfer with the water cone with the wate

would be used in produce text for superim-

The idea is similar to that being studied at Leicester Polyteclinic with the BBC (CW, May 18) but with the emphasis on algorithms rather than large dictionaries.

The basic principles of both projects are the same: typists listen to the speech of elevision programmes as they are trans-

Research into television sub-titling for the deaf

Or Alan Newell, feel that as it is not possible proper names, the high error rates of the typists, etc. It is better to aim at having output that is understandable available of the computer storage output that is understandable available of the computer storage of the important factor that is understandable available of the computer storage of the computer storage

some practice, but not standard English.

University is working on the design of kind of phonetic code. This is translated into produce text that consists of a good many elevision sub-titling systems for the deaf in English by computer in real time and the stylised phoneticisms. For instance, which shorthand keyboards and a computer played by the Ceclax or Oracle cantion "friendly" might come out as "frendli" or played by the Ceclax or Oracle caption "friendly" might come out as "frendli" or facility. "frend li". This has the advantage that The researchers at Southempton, led by keyboarding errors usually produce output that is recognisable, when dictionary sys-

output that is understandable, possibly after studied at Southampton is the acceptability of the sub-titles to real users. This is to come



52 teams at the **Palace**

National Sports Centre of Crys lal Poloce on September 30 ore building up and it promises to be a great day out for computer people, whether they are com-peting or just coming along for the ontertoinment.

A total of 52 teams have

qualified for a place in the final, 29 men's and 23 women's, and they have all been invited to take up the challenge of Crystal Paleos. Acceptances are already rolling in and the finol list contenders will be published

QUALIFYING TEAMS

QUALIPYING TEAMS

MEN Bonk Organisation, Plympush;
Walss Oas; Clertool Mediost and
Oeneral; British Ateal; Rowntree
Mackintosh 1; Rownireo MackIntosh 2; Plett Bose Lawell; Provident Monagement Barvices;
Midishd Benk, Shettleld; London
Barough of Hounelow; Commercial
Union; London Berough of Londoth;
Bonk Organisation, Whyteleate;
Bobert Home; London Scrough of
Keneingjon and Chelees; Bordon
and Gotch; Ailled Buppliers; Homiros; London Transport; Midland
Bank, London; EM; Midland Sank,
Santie; MANWES; Department of
Employment; Peterborough Data
Processeing; UCC; Boleon; ICL
Scientific Longuages; Olversey.

Proasseing: UCC; Soloon; ICL Scientific Longuages; Olverey, WOMEN. Burmah Oil; Foster Wheeler; Rank Xeroxi Woohworthi Midland Bank, Shelffeld; Provident Management Services; Rank Organisation; Whytelgate; Commercial Union; Peymoeter General; British Raley Wireless; London Borough of Kensington and Chieleso; Alfied Suppliers; CABE; Midland Bank, London; London Transport 1; London Transport 2; City University; MANWES; Littlewoode; Inland Revenue; Pejerborough Oato Processing; Soloon; British Industrial Plastics.

DEC's entire line'

world minleomputer market, Digital Equipment Corp would seem to occupy an impregnoble niche in the computer industry. Yet the company is a perennial torget for gloomy prognostica-tions from industry pundits.

Latest in this line appears to be Frederick Withington, of Arthur D. Little Inc. Menio Pork,

Withington is quoted by the Wall Street Journol as saying that, with intensified IBM competition in the minleomputer market (from Saries 1), and DEC'a expanding line of large computers, the day is rapidly approaching when DEC and 1BM will compete in every area. What will DEC's president

Ken Olsen do, he wonders, "once the IBM steamroller goes ove his entire product line?"

Much is made in the article of DEC's expanding range of mainframe computers, now joined by the low-cost DECsystem-2020, and mainframes are estimated to make up 12% of DEC's business.

Yet DEC Itsaif says that although its mainfraines are growing faster than the industry as a whole, they are a declining proportion of the company's

"They have rapresented bet-

GEC doubles mini capacity

FOR long tha poor relation of the GEC family of companies, GEC Computers has been plunged into the limelight by use of the GEC 4060 mini in the Post Office's Prestal viewdata aystem. Aiready widely used in industrial applications and by UK universities, tha 4000 series haa been winning a rapidly growing market, and GEC is in process of doubling manufocturing capacity for the mini line.

A second plant is to be opened at Dunstable, Bedfordshire.

CDC, NCR, Honeywell ahead in first half

Data, NCR and Honaywell Indicala that the computer business is bouning in the US, but profits at Burroughs' UK subaidlary turned down:

At Control Data, profits were of \$110 million, providing the up a healthy 36% to \$41.2 million company with an overall exon turnover up 18% at \$1,300 traordinary profit for the half year of \$181 million on total puter business did particularly turnover up 8% at \$1,239 million. puter business did particularly well in the second quarter with profit up 64% at \$12.3 million on turnover up 21% at \$449.1; confirming the company a don-fldance in the success of its large cafe Cybar machines diwing at \$75.8 million on turnover up 22% at \$883 million, in the first half, profit was large cafe Cybar machines diwing at \$75.8 million on turnover up 20% at \$1.650 million. Burrougha UK's first balf appleton Papera division to British Amaricant Tobacco during the sacond quarter, NCR's figures are a little difficult to Figures are a little difficult to \$2.18 million.

FIRST half figures from Control look good, with nat profit in the sacond quarter from continuing operations up 44% at \$39.9 mil lion, on turnover up 7% at \$614 million. The Appleton sale gave NCR a non-recurring net profit turnover up 8% at \$1,239 million.

IBM will steamroller that DEC's pretax profit margin

business, and they are at the low end of thot range right now," Al Mullin, manager for investor relations told CW last year.
The orticle highlights some of DEC's strengths, and mentions

approvingly that salesmen are paid a salary rather than cnmmission, so that they tend to sell the best machine for o company's business rather than the one with the highest commisof 15%, compared with 20% for DEC's decentralised management organisation, with 13 produet and marketing groups.

The figures quoted for the minicomputer business under-line DEC's continued preeminence: after DEC with 41% come Hewlett-Packard with 14% and Data General with 10%. IBM is given 2%, a share estimated to sion rate. However, it auggests rise to 16% by 1961.



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Electronics Weekly

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WILLE the Fujitsu and Hitachi strategies for entering the world cumputer market are fairly plain, those of the other major grouping, NEC-Toshiha, have been clouded by their relationship with Honeywell and are

The two companies developed a joint computer line, Acos 77, hased on Honeywell's Series 60, but Toshiba has now effectively withdrawn from the large computer husiness and NEC is

A Joint compnny, NEC-Toshiba Information Systema has been formed in which NEC. hus 60% and Toahlba 40%, Toshiba's menufacturing focilities have not been included, but they are now effectively con-"fined to refurbishing mochines which come back from JECC, the Japan Electronic Computer

in Japan, JECC is the sole rental agency for locally-built inochines, buying then from the manufacturer and thereaftar taking oil the lease in come Itaolf. If o inschine is returned before the contracted period of the least, JECC requires the manufacturer to buy it back.

Unless thesa returned machines are refurbished and put back on the market they would be a dead loss to Toshiba hut the company has ceased to build new mechines.
NEC has been a Honeywell

licensee aince 1962; computers are about 20% of NEC's business of the Japanese market.

Toshiba signed licenca agree, mente with GE In 1963. Honeywell took them over when It nequired GE's computer business in 1970. Computers are only about 5% of Toshiba's business and the company hea about 5% of the Japanesa market, giving the combined NTIS about 17%. just behind Fajitsu.

"NEC devaloped the Honey-well 2000 line beyond our limits; at the top end and had far more customers than we did," asid Duke Sterling, Honeywell vice-

president for Japan, "As a result they have developed Level 64, which runs 200-2000 software, further than Cli-Honcywell Bull, in order to satisfy these

There ore eight models in the Acos 77 line. At the bottom end, the 77/200 is based on the Its lian-built Level 02. The 77/300 and 400 match the CII-Honeywell Bull Level 64, and the 77/500 is nn enhanced version

The French and NEC started to work ingether on this: it what project colled P7A, But C11-HB nulled out of the project and

Joponese threat to the US computer Industry, but a close examination of the businessee of NEC and Toshiba pats the threat into parspec-

computer interests, and they are ceiling into a cets rated mainframe market. The

ent under which mechtego have to be

errangement under which mechteon have to be sold to JECC for anward leasing relieves them of the nacessity of building up large leasing tinenco factilities of their awn, but at the sems

time requires that their market base grows rapidly each year, because the minimum JECC

The Japanase market in about 12% of the

world computer market, and tagel menetec-

turere have 57% of this, But Toshibo's 5%

share means that it has a derisory 0.6% of the world merket, and expining why it decided to

be compatible with both Level

64 and the lines inherited from

The 77/600 is approximately equivalent to a 66/40, and the

77/700 to a 66/80. The 77/800 and 900 are the fruits of a joint

development project between

ioneywall, NEC and Toahiba.
"We worked together on the

conceplual design, and they

have made changes aince. The

machines are what we an-

nounced as the 66/85 and then

"commented Sterling.

MEC, which after Fujitsu has been the most

Insteed edopted P7G, which is to Toahiba use air-cooled CML-2s,

the 66/85 were purely economic." Sterling insisted. "IBM came out with the 3033 and it became clear that all the hardly rare in the computer inproduction a completely new roughs dropped its B8700, Unias powerful as the 66/80 just were not worth it. cspecially since the life span of the product seemed likely to be fairly short."

ween the 60/85 and the 77/800 and 900 are that Honeywell was planning to use CML-1 micro announced in Japan long before Honeywell snnounced the 66/85 circultry, which requires water cooling, whereas NEC and thing to bid for sxisting cua-

Putting Japanese threat into perspective

well placed to become the counterpoles to the Fujitsu-Hitochi combine, since MITI, the

penase ministry of trade and industry, went

two Jeponese computer lines, one tSM-compatible and the other not. Its 12% of the Jepanese market implies about 1.5% of the world market, now boosted by Toshibo's base.

Even so, it only spande about \$45 million on

research and development annually, which is much less than its US counterparts, less even than is spent by tCL, which gets its R&D on the cheap by doing it in the UK.

documentation, training personnel and setting up mointenance facilities make it almost

mpossible for NEC to enter the world metn

Why then ere the Japonese compenter

etablishing subsidieries in the US? The ex-

sive — thet all the major US menufacturars are colling hard in Jopan, bild they need a source of

The cancellation of the 66/85 not really a viable option.

chips which delayed the project months to make the necessary

nation may be more defanative then offere

rame market in its own right.

"We are buying some CML-2

chips for future products. The

other main difference la lhat

they use a different input-oulput

was regarded as a mejor setback

for Honeywell, but it is an open

secret that the company la wor-

66 line and, in view of the com-

psratively small power improvement it offared, the dif-

culties with the CML-1 circuit

exclusive constructional design

ng on a successor to the Level

processor from ours."

The enormoss costs involved in propering

"The reasons that we killed and allowed Honeywell time to rethink its strategy may well have been a blessing in disguise. Such setbscks are nnyway

ensts involved in putting into dustry: IBM cancelled FS, Burprocessor which was only twice vac shelved its plans to merge 1100 and 90 series into a united line and Slemens has just drop-ped its plans to add a 7.770. taking instead the Fujitsu M-

tomers within the government.

It has been suggested that

deed should, take the Jepanese

machines as a stop-gap, but Sterling is adament that this is

"The machines are basically

compalible with ours, but the

communications are different

because of their ayatem of nel-

working, and the operating sys-

lem has been adapted to Kate-

"It would only lake man-

The Acos 77/800 and 900 were Honeywell snnounced the 66/85

computer business have been surrounded by it many miaconceptions and wild rumours as hi relationahip with its two Japaneae partners, Nippon Electric Company and Toahiba. In order to find out the facts, Tim Palmer visited Duke Starling lpkturad left), vice-pusident of Honeywell's Japan, Mexico and Cenada divi-

well's Level 6 mini for manufac-

200 executive."

"Initially they are building the

While Nippon Electric is en-

communy in Bosion, which sells

printers und is planning to in-troduce the NEAC-100 office

FEVV areas of Honsywell

adaptations, but the costs of building up spares, and training people on mulitenance would Level 6/43, but they will expand the line both up and down. They are at present taking the MOD. mean that it was not worth bringing them into the US if they were going to be replaced n less than five years."

For the same reasons, lioneywell does not expect NEC to try lering the US market via its to market the machines in the US in competition with Honeywell, sithough the possibility that they might be sold to n few large multi-national Honeywell sccounts, which also have machines in Japan, has not been

The agreements with NEC

US in order to stay competitive in their home market. The big missed opportunity for the

allowed to allp away.
By following a closety ISM-competible

route — end hemeseing the genius of Gene Amdohi, Fujitsu does have the potential to become e major force in the world market, and

Hitoohi, following a similar rosts and taking itelose partner is also well placed.

Sut the prospect for NEC appears to be largely confined to sales of peripherols, small systems, and above all components, it is quite

possible that the Jepenose will become and a-puted world leaders in semiconductor con-

ponent technology. The problem in a computer context is that these represent on streetly small

and rapidty declining proportion of the total

and Toshiba consist of licence

ngreements extending to 1982

and exchanges of technical ex-

pertise extending to 1979.

Nolther agreement is expected

to be ronowed, but it is likely

that new agreements will be

signed in auch nreos as

"Aport from licence pay

ments, we have had a few soft-

were products from our

Japanese partners. Wo gnt our PL/I compiler for Level 00 from

Toshiba and a Cobol pschage

ne's Portuguese factory.

lconductors.

nese was the follure to ecquire any at tha Jepanese was the foliure to ecquire any of the US companies which pulled aut of the bust-noss. Tashiba had links with GE, and Hitachi

RCA, and Xerox and Singer were elec

Some of the gripes levelled against the banks is that they are slow and impersonal, and that bank statements arrive irregularly. As a result of an experiment at the Kinross branch of the Clydesdale Bank, all its branches will be linked into a nationwide system.

Laura Tatham looks at the system which promises, not only to give faster transaction processing at the counters and tighter management control, but also that cheques and paying-in slips will disappear. A record of each transaction will also be given.

Writing of cheques soon 'thing of past' By Laura Tatham

MORE convenient banking, mora personol service and better record keeping are among the from their banks according to a recent market survey by Clticorp, New York's largest banking company, Britons, who by now suspect that the long promised real time Utopia is a figment of the clearing banks' express similar views if con-

-Customers of Scotland'a--Clydesdale Bank (a whollyowoed though largely autono-mous subsidiary of the Midiand) will soon be luckier than most of us. The outstending success of a pilot scheme now in operation at two branches marks tha start of a project that will pul even the niest remote of its 368 branches online via e total of 1,500 terminals linked in a countrywide

Fsater, more accurate transaction processing at counters and tighter management control will not be the nuly benefits thet Clydesdale will derive from its Autobank system. For customers, its most attractive faatures are likely to be that the writing of cheques for their own withdrawais and of paying-in slips will be a thing of the past; and that a single magnetic stripe plastic card will be the passport not only to these but to otlisr services such as caah dispensars.

Clydesdale, whose system is

benefited by the cannineas with which it has approached computing in the past. Having, until now, remained aloof from any but comparatively primitive batch operations, it has been able to cash in on the advantages now available through the use of minicomputers and other

considerably more sophisticated

than any yet announced by any

major British or American

clearing bank, has directly

As a result, though Autobank will incorporate a remarkably comprehensive range of facilities and fali-safe features, its total cost will be less than half of that of a mora conventional The Autobank communica-

tions network will incorporate 16 Univac V77 minicomputers. These, installed hi pairs at seven regional centres and at the bank's head office and computer centre in Glesgow, will covar the whole of Scotland. Each V77 will serve a group of 15 to 20 dedi-coted telephone lines to each of which a total of up to 18 terininals in several brenches will be connected. For the pilot scheme, paira of V77a have already been installed at one

regional centre and at Glasgow. Special hardware and aoftware, designed by Lion Systems Developments of High Wythe lines served by one V77 to its partner if it develops a fault, and

has been recilfied. Software added by Univac to the V77 Vortex operating sys-

tem causes each computer to dump all the records it accumulates onto the disc of its partner at one-aecond intervals. Service will therefore continue without interruption if one processor goes down, though response time may be slightly alower than the normal 1.3 second average. Before Fortronic, a small

For customers, the most attrective fea-

tures ere likely to be that the writing of

cheques for their own withdrawais and of-

paying-in slips will be a thing of the past; end

that a single magnetic stripe plastic card will

be the passport not only to these but to other

reached a position of stalemote. you satisfy our criteria we pro

services such as cash dispensers.

young Scottish firm and a customer of the bank, demonatrated its ability to produce a purpose designed low-coat lerminel, the Autobank project had

Derek Gall, manoger of the

department, had formuleted

very clear ideas about system

performance and was convinced that his criteria could be mat

only by equipment and softwara

more advanced than those de-

Discusaiona with asveral

standard hardware and software reverts to norms! after the fault - accepted the challenge to design and manufacture a terminal that fulfilled all the bank's

requirements and would cost under £i.000. Sentimentality and rash speculation are not characteristics traditionally associated with Scottish bankers and the directors of the Clydesdale are no pleased at the prospect of employing native knowhow and enterprise, they were prepared to do this only on a shered risk

drcw a blank. "Impossible,

cither in your timescale or ot the price you are prepared to pay" was their unanimous verdict.

The cost of 1,500 terminals at a

minimum of £2,000-£3,000 cach

was, of course, a major obstncle.

Fortronic — a compony that since its inception in 1070 has looked for organisations with

problems rather than marketing

"Work out e solution and install prototypes at minimum cost," they told Fortronic. "If

in the Autobank scheme.

keypad beside him, the teiler initiates the routina, through the terminal and: checks the customer's identity via its card reader. She then enlers the amount including, where appropriete, the denominations of notes and colns,

Control equipment

Improve reaponse time.

Designed and built by Lion,

this control unit, which also in-

function is to scan each terminul

for o "request to send" aignal

out the others until the message

coming computer messagas.

Using other special equipment,

very small branches will operate

as slaves to the nearest lorger

pliotaitea, a customer wishing to

mske a withdrawai or pay-in passes his Autobank card to the

teller and names the type of

transaction. After he has ent-

ered his personal number on the

At Kinross, one of the two

is completa, it also controls in

After verification by the terminal the input data la transmitted to the regional V77. A duplicate record is printed on the terminal tally roll - one copy for the customer and the other for retention. All transec-

The systems flow chart shows the configuration that will be installed at each of the Clydsedsis Bank's brain interesting point is that the system uses both ordinary telephone lines and its lines. lines if this is necessary to tion deteil is logged by th regional cumputer and remain avsilable for interrogstion. corporates diagnostic indicaup is now a guick and simple jo tors, la compact and low-cost, its

for tellers. Regionol data la also trans mitted to the head office V77s which occumulate it on mog netic tope. After closing hours these tapes ore transferred by hand for batch processing on the bank's mainframes.

All the Univac V77 contro functions are handled by the standard Pronto transaction processing software slightly en hanced to accommodate th Fortronic terminals and oth special requirements. This operating under the Vortex multi-tasking operating system has contributed greatly toward the remarkably quick develop ment of Autobank.

In a short apace, it is difficult to describe the other fallbeck measuras so it can merely tatated that these leave n facility that may well be unique - a video terminal at head office which permits traffic monitoring on all lines and, considered necessary, redistdbution of traffic.



branch terminal controller/ When the transaction has been completed, a duplicate record is printed or the terminel's tally roll. One copy is given to the customer and the other is modern. This is designed for the terminel's tally roll. One copy is given to the ountomer and two-wire SI lines but is capable. Gled. The details are also togged by the regional computer. To upgrading to four-wire S3 makes cashing up a quick and simple operation. modem. This is designed for the

computer. Honeywell, which continues to sell the NEAC in Australis, is planning to me the Jopanese market. We also have an agreement

with another of the big si monufocturers in Japa, Mitsubishi in 1963, Mitsubishi Office Machinery, MOM, signed an ogreement to market but products in Japan. They have sold Gamma 10s, G100s, Bull GE 58s and Level 61s, and they is have 10 6000s (the Level 56 pedeceasor) instolled with agricatural co-operatives."

The troding group to which Mitsubishi belongs is 1810 largest customer in Japan and us n result, Mitsubishi has bee looking more end more to Fulitsu os a partner. In 1974 Mt)M set up a division to market medium-scale Fujlisu system and in the process, Fujitsu to quired 14% of MOM.

Ultimately MOM has to start marketing the large IBM compatible Fulltau M-series within the Mitsubishi tradity group, but this has not happened

"We are now negotlating b buy the division of MOM who markets our products," and

"The new company is due to be formed in August; we will have 80% of the shares and MCIM will have 20%, because support from Misubishi will k valuable to us. The current managing director of MOM wi be the new president sad the company will employ shout M

we will be selling Level &Level & Level & naching to replace the 6000s MOMins sold, through the new company.
"The machines will be sler from NEC. We take 30 and

60 Megabyte disc drives from NEC for Level 61 and Level 62 portad from France and the and the prices are very com-US; the Japanese tailf against imports is still tremendous, but petitive even against those it la nevertheless just work uoted by Megnetic Peripherals being in business there."

Overall, how does Sterling # MPI is a joint venture on disc production with Control Dots in Honeywell's collaboration its Japanese partners?
"Up to 1974 or so, the flor a which Honeywell and CII-HB

"Otherwise, NEC is a major information was all one way in ource of components, although ot a sole acurce for any item."

"Up to 1974 or so, mental information was all one way in our base in our page."

Information was all one way in our page." Outside the mainframe area, collaborating on development of the cama osterior projects. They cama osterior minicomputer, office computer to learn, but they was the and peripherals markets, while quality engineers and fire the projecte. They came variety was to learn, but they was the projecte. They came variety was to learn, but they was the projecte. They came variety was to learn, but they was the projecte. They came variety was to learn, but they was the projecte. They came variety was to learn, but they was the projecte. They came variety was the projecte. NEO has just adopted Honey- made significant contrib

source of components, although not a sole source for any item."

PAPERS are solicited for SEECO 78, a symposium and ambibition on Environmental Engineering Today to be held at the Wempley Conference Centre, Longor, on May 9, 11, 1979. The event is someored by the Secrety of Environmental Engineers to think the 20th ampreemany year agreement will be selected for their wallings to project aspects of environmental engineering to resiston to both the requirements of boday and transfer for the walls. Described to the conference of the stay and transfer for the transfer of the Secretary SEECO 78. Owich fall Engineering for the test from the Conference of the Secretary SEECO 78. Owich fall Engineering for the Secretary SEECO 78.

Calls for papers

15.th, 1979, in the New Therin, large burg. The theme of the coppes 117 Options for a European (north organised by the Commission of the European Communities, Abstract Dunning, Commission of the Section Communities, Jean Momes and B4/129, Plateau de Richberg, 1917, Luxembourg, Telephone, 2017

A bank cloric of the Clydesdate Bank's Kinrose prench inserts the pleatic Autobank card into the light-well retronic and the clark initiates the rolls through the torninal while the customer (tots) enters his pass code on the key pad. The clark initiates the routh through the terminal and checks the customer's identity visits eard readors. She then enters the smount one has been presented and checks the customer's identity visits eard readors. She then enters the smount one has been presented and checks the customer's identity visits and readors. She then enters the smount one in the customer's identity visits and readors. series of two-bay seminars spread over a period of mothis, the first being held on October 5-6, and the bat in May 1970, in Alirmingham: Deligits from Mendull Steath, 38 Priory Road, Sheffield S7 ILX. bejl 6742 681571

INTERACTIVE computer graphics for angineers is the title of a three-day course to be head at the University of Colesciar on September 25-27. It is inteeded for ongineers streedy experienced in the use of computer, Details from the Computer Oraphics Course Secretary, Dept. of Englescring. The University, Leicester LEI 7RN, Tal: Leicester 50000— sak for Engineering Department.

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A COURSE for the managers of ocientists

A COURSE for the managers of potential user departments had been organized by Kendall-Steath 10 will take the form of a

SUBJECTS of covrses to be rue by the NCC in the near future include systems enelysis and design, to be hald in the Midlands on September 11-22, Filetab programming, Macchester, September 15-8, and real time program design, Manchester, October 23-November 3, For details of oil the NCC's courses contact the National Computing Centre, Oxford Road, Manchester Mi 7ED, Isl. 081-228-6333.

COMPUTER engonomics is the subject of a course drainised by Tom. Stewart at Longhbytoush University for September 19:24. A special realize will be workshop seasions on problems selected by course members to help them improve their own.

systems. Further details can be had from Tom Stewart or John Wilcox, Department of Human Sciences Loughborough Uni-versity, tel: Loughborough 63171, ext 392 or 395. A COURSE in operations management leading to the award by the CNAA of the coagraduate Oiploms in management studies (operations specialism) is offered by Stough College of Higher Education Details. can be obtained from Mrs Verbecke at the College, Slough 34585 ext 49.

THE Department of Business Studies at Houndow Borough College is offering two evening courses in computing in the autumn term. The introduction to com-

puters and systems enalysis begins on Tuesday Soptember 18, and the Cobo course on Thursday September 28, and each comprises ten sessions. Furthe details from the Ospatiment on 01-38;

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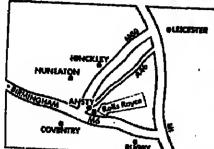






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ndisee on future developments.
This present computer is an ICL 1908/
This will be replaced by an ICL 2950 bytesty using DME and here the VME (operating system. The Beniot System Programmer will be reapphished for the software institution of this computer and for the development of respects software tinking the ICL 2950 to the Roth-West Network in collections with other universities.

Expérience in communications acquisitions and software website in advantaged in an and software website in advantaged in the software website in advantaged.

tagefuls.
Spinty on the spale 15, 664-27, 308, .
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Application forms to be returned by 11th August, 1978.



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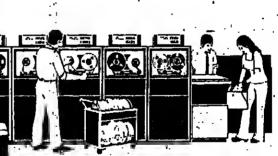
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Applications are sought with proven sales ability and lamiliarily with data processing, consultancy, bureaux or hardwere software Positions will be based in either the Reading or Manchester offices.

Area Sales Engineer

To operete in the South East from the Reading headquarters of the highly successful UK Sales team, selling Data Communications equipment to compuler-based users.

Preference will be given to applicants with direct selling experience in data processing, Communications or electronics.

All sales positions carry attractive base salaries plus generous commission and company cars.

Product Applications Engineer To join the Engineering Group giving product support to the UK Sales Team.

. Degree HNC qualifications are expected plus experience in design and development using digital and analogue techniques. Direct experience in Dala Communications and compelence in software al

assembler level would be an edvantage. A compelitive salary commensurate with experience and ability will be paid

The Company offers nearly live weeks annual leave and membership of a first class contributory pension scheme with free life assurance.

Applications (male or female) should write with details of age, qualifications and experience, to: DJ Kichenside, Personnel Olficer, Racal-Milgo Limited, Prospect House, Thorn Street, Reading, Berks.

Western Europe Holland Software £8,500 - £16,000

We are actively recruiting programmers, analyst programmers, Consultants and Senior Consultants for career appointments in Western Holland. The environment you will encounter is one where high quality software design and implementation is essential, and it is important you wish to be involved professionally with individual customers' systems. The company is already established as a leader in its field and expansion planned is considerable thoroughout Western Europe. We are particularly interested in career-minded people who have had experience in an on-line, real-time environment, or switching or networks using mini-computer based systems. Projects you will encounter will be extremely varied, often extensive and usually sophisticated. Successful candidates can expect a competitive continental salary (generous tax concessions can

also be applied for), interesting and worthwhile job content, excellent conditions of employment and benefits associated with a prestige company.

Telephone me, Bill Seymour, for further details; interviews with our client will take place \$P\$大概的第一次的中央共產黨各位

Bill Seymour 01-637 5001

U:R: Office, Portland House, 4 Gt. Portland St., London WIN 5AA
Andrew Ells, Sarphatistreat 30, Ameterdam, Holland, Tal. (020) 264664

Accord Computer Efficiency



The Dynamics Group of British Aerospace has evolved from the best expertise and engineering knowledge being applied in this country to the design, development and manufacture of guided weapons. One of the spin-offs of our work in this field is the ability to produce Automatic Test Equipment (ATE) of the highest standard. To help us to continue our expansion programme, we are looking for people of various disciplines to work on ATE.

Group Leader - Programming Systems

The Software Facilities Department of our Automatic Tast Systems Group has as its main functions the provision, maintenance, enhancement and operation of the software management and data-handling lacilities required to support the generation of application and self-test software for Automatic Test Equipment. This involves compilers, editors, emulators, translators, and a dynamic management and data-handling system to sarve the needs of the ATE Engineering Department.

Within the Department, we have a vacancy for a Group Leader to be responsible for two teams of Programmers, one working principally in Cobol on an IBM 370/158, the other on mini- and micro-computers in

Candidates should have varied experience and be competent in both project and man management, in addition, ability to understand an end-user's needs will be useful.

Software Systems - Microprocessors

Weepon systems use digital processing power and, with the advent of the micro-computer, this use will extend and the applications will become mote complicated in the search for improved performance. The systems will use mini-computers and micro-computers involving distributed processing, real-time, mufti-processor and multi-tasking technologies, with full high-level fanguage and host computer support. We need software system engineers/consuftants to assist our Engineer-Ing Teams in tackling a whole new range of problems in the system design, assessment and test areas arising from the move from analogue to digital systems. Your background will be in Control Engineering, Electronic Engineering or Computing Science, to graduate standard, end you will have experience with mini-computers or micro-computers, including programming in a high-level language (preferably Coral).

Automatic Test Equipment

We have vecancies for people who can design and develop electronic test equipment, generate the technical requirements for test sets end analyse the essocieted documentation, and then verify the integrity of the test peckege. There ere also vacancies for similar people to work on mechanically orientated test equipment.

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The salaries offered will reflect the importance of the position. Interested candidates are esked to sand their career dateils or write for an application

Mr. P. C. Ellinger Ref: A511, Personnel end Training Dept., Site A British Aeroepace Dynamica Group Stevenage-Bristol Division Six Hill Way

Stevenage, Herts, SG1 2DA Telephone Stevenage 2422, Ext. 3129

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We need severel more programmers to help us keep our lead in the Word Processor, merket. We design and write essembly code programs for 8080 and Z-80 microprocessors. You can have any job title you like (except, perhans, Director), provided you can write code and make it work.

Experience of microprocessors would be useful — but len't essentiat. We prefer working with graduates — or et leest people of an equivalent standard. The main qualification is however, the ability to produce useful programs from a minimum of epsclitication — efter all, if we tell you exactly what to do we might sevel write the code ourselves!

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Shift working is involved. Salary range including shift allowence C2855-C4499 per annum. A

tevel al experience to join a ge-elecal teem, please write, quoting vacency number CW / 233 / 78MR giving dosella ol aga and experience to the Parsonnel Manager, Cantral Electricity Ganeraling Based, Hastucks Green Road, Shirlay, Selihuli, West Midfands, 980 4PO, by 4 August, 1978.

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A accord post is evallable in one of the above cross for which a science. Research Council Studentable is available.

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The Group are about to develop two major systems:

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- Detailed knowledge of at least one commercial system
 Have written program specifications and probably designed
- The ability to communicate with management

Here is an ideal opportunity for an experienced programmer to take a management role in an expanding computer department whose offices are located in an extremely pleasant residential area In the North of London. The Company offers all normal benefits

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a lerm courses ete ollered on a day reli each peri of the examination feading to: Mambership of the Society (MSCS),

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WHO ARE YOU?

YOU will be intelligent, enthusiastic

YOU will be at least 25 years' old with

several years' systems soltware experience

operating systems, particularly NOS/BE.

knowledge of operating systems, the ability

to quickly comprehend new concepts and

YOU may expect the possibility of travel

YOU may have a degree in computer

science but more essential is a sound

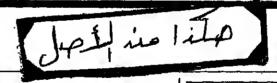
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Sand curriculum vitae to Division of Personnal, Inta netional Atomic Energy Agency, P.O. Box 590, A-1D1 lenne, Austria, not later than thrae waeks from todey

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THE SALES BIT

PROSPECTING (3)

i : '

The protective secretary

a new business prospect is the "protective" secretary. "Mr Prospect is in a meeting at the moment" must be o famillar cry to many a

rom the outset.

not the chattels of their

mastera; they are people

performing an essential secretarial function. Many

are in the job because they have decided upon a busi-

ncas career rather than a

domestic one, and as such

are typically very indepen-dant ladlea who reapond

badly to male chauviniam. Tharefore, any hint of

connivance, flattery, or

selesman starts out by

attempting to work with the

prospect's accretary rather

than getting pest her, he will utilmately have fewer

nama, while remembering

the first instance. The

aleaman needs to become

it is part of your job to help

him select those salesmen whose products could bring

most benefit to your com-

"The computer system I

in other words, the sales-man should make the The Immediate reaction secretary realise that he of most solesmen is to think uppreciates her insportance of ways around this materwhile at the same time innol obstactc. I hove seen troducing a decision crisalesmen driven to desperterion outside her scope, otc actions by the sheer thus demanding the infrustration of finding oil valvement of the prospect normal methods of enmwhich in turn should munication blocked: conrequire a meeting. Comfidential telegrums, dis-guised voices, knobbling pany policy and competl tinu ore uscful devices in homeword buyers, and so this context, and an "opticon. One can only admire the nal close" on the best tline detorinination and ingeto call does no harm at all. Having said that, it is nulty of such efforta, but often they become necessary through lack of subtlety and common sense

clearly better for the saies man not to get involved with the prospect's sccrctary other than at the cour-The attitude of the salestesy level.
Often the manner of the man towards aecretaries is particularly important in thia context. Secretaries are

"Is it easier to contact

him at the heginning or the

end of the week? Does he

tend to be more readily

available in the morning, or

the afternoon?'

salesman's approach can get him straight through to the prospect without any resistance from his secreimportant that his attitude is bold without being famillar, thus suggesting an existing business relationship between the prospect

Of course, the aelesman cannot be aure that the pro-spect will be in the office when he calls. In this situation it is best to ring off after establishing the best chatting-up techniques, is bound to introduce com-municative barriers. If the time to call again, avoiding any further discussion with the sccretary.

in his eagerness to sell he might just sell himself out of a reason for calling again.

The first stage is to die-cover the secretery's full Survey of 100

processors

salesman needs to show respect in order to gain it, and christian-name mode t00 different word processors is available in a 70-page booklet from Computer Information Services, London, Called "All with a atrenger is never ad-Having discovered who Services, London. Called "All about Whrd Processors." It costs £10 and is a selection from the processing "Manual of Word Processing" looseleaf information service.

The full manual costs £200 plus £200 a year for its monthly updating service. Only word processors available in the US are covered of \$126. address her, the next step is to recruit her assistance and the best way to do that is to ask for it. Obviously, the

only help the salesman to be put through to the prospect, but if this results in resistance only then the are covered, CIS is based at 286 Pentonville Road, N1.

involved in more specific reasons why the secretery PC brochure ahould heip him meet her

printed circuit systems has been published by Ferranti Cetec Graphics. It describes the apocialised equipment developed and procedure devised by Ferranti for manufacturing artwork needed for printed-circuit production. Copies are exact. his situation and a need for assistance, while stating an appreciation of the secretary's responsibilities, the salesman can achieve positive results production. Copies are available from Technical Sales For instance: "I am sure Office, Ferranti Cetec Graphics Ltd. Ferry Road, Edinburgh, EH5'2XS; Mr Prospect is constantly approached by salesmen wishing to sall to your com-pany, and he doesn't have this to see the nell I reall to

Puzzle answer

THE message is: 'The Kt's tour with one call only upon each square has long been a need to discuss with him is source of fun for chess fans not only bringing when not able to visit their significant benefits to some chils. At first it may seem of your competitors, but is hard by any route at all but alao closely allied to com- when a way is found by one pany policy and only he whose maths is good. The could decide the validity of is I and '260' is 64, and ell the advantages involved. BASILDON

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A well-established manufecturing organisation, pert of an international group, wish to eppoint e Senior Analyst to head the systems learn in their date processing depertment.

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Ref E1/2707

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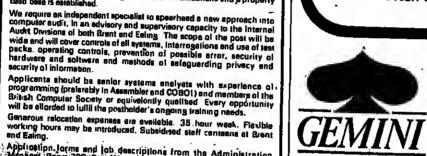
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GRYPHON Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Block 8 (Block Mode Transfer)

Hex and Cleo have slipped into the research centre of Sun Guine, persuaded Lumbdo and Zap to work with them and slipped and again unobserved. At the bush where their stipped that again into secreta. At the man where their getaway motorbike is hidden, however, they are confronted by its irate rightful owner, with two law enforcement

HEX took one look at the armed robuts. "We surrender," he sald. "Don't shoot." He didn't want Aseli to make a sulcidal attempt at resistance; hut Ascii liad already disappeared into the thicket.
"Come with us," commended James Hock.

They followed him to the main gate. There a sentry challenged him.

"I have come to turn these criminals over to your ecurity service," said Hock. "They stole my motorcycle. The girl is a human and f suspect the android is some sort of

Before the gnard could reply an imposing figure strode towards them. It was Zap. "Mr Hock, I presume," he said. "I understand you've had some trouble with these two

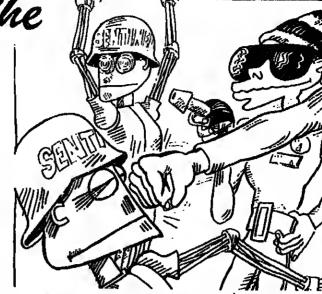
"Quite so," replied Hock. "They essaulted me and left me by the roadside. f want to report them to your security officer."

"I em acting chief security officer," sald Zap, flourishing his ID-card authoritatively. "I'll take charge of them personally. These are not just common thieves; they are suspected of belonging to the Hexadecimal Kid's terrorist gang. You may not be aware that a aubstantial reward is on after for informatisn leading to their arrest. The System vill be indebted to you."

Hock beamed. "f'm not called Add Hock for nothing." What are you celled Add Hock for,?" Inquired Cleo. "Because I can put two and two together, stupid," he

Cleo decided no further comment was necessary.
"Now," put in Zap, "I'm afraid we'll have to take the mstsrbike in for forenaic tests. You can, of course, stay

ere, et least until aome trenaport cen be erranged." "Thet'a very hospitable," replied Hock. "As it happens I was on my way to give e demonstration of my wordprocessing package to your aoftware manager, but es these



nooligans tore up my snurce listings I'll need a while to moke it presentable again."

"Fine, then, just follow me," said Zap, and added to the law enforcement robots: "You con go now, tlinnk you, we'll hondle this ourselves."

Hex hardly dored sneak a glance over his shoulder to see

If they had obeyed Zup's order. Sure enough, there they were, trotting obediently into the distonce.

Once inside the main building Zap put his arm round Hock's shoulder and began chatting expansively ohout the virtues of the PUFTA system, about which he appeared quite well informed. They quickly reached Floor D and made their way to what Hex seemed to recall was Lembda's door. Zep unlocked it and unborded blocking the rest to the state of the seemed to recall was Lembda's door. Zep unlocked it and ushered him in. "This is your overnight accommodation. I hope you find it comfortable. If you need anything, just request it on the viewdeta terminel. Now excuse me for a mament: f must deliver these two to the bosement cells for interrogation." He bade Hock goodnight and shut the door.

"Easy does it," whispered Zap as they walked back to the

Lambda was welting for them in the fayer. All fair of them marched out together. Hex noticed that Zap had unfastened his hoister and drawn out a terminator, which he brendished menacingly in Hex's direction.

"Any trouble from you," he called out loud enough for the sentries to hear as they approached the gate, "and you'll Both guards stood out to check their progress.

Orders to take these prisoners to Galactic Headquarters," explained Zap, pre-empting their questions.

"Whose orders? "My orders," replied Zap, pointing his terminator directly

at the questioner. The other sentry moved fast, but not as fast as Hex who grabbed his blast-gun and stuck five digits in his interface before he could fire. Seeing this, the first one dropped his blaster and raised his hands in the air. They hastled him through the gateway.
"Where's the hike?" asked Zap.

"Follow me," replied Hex. When they got there, Ascii, who had eluded Hock's searchlight and laid low since their capture, was still walting. They ried up the sentinel and put Cleo and Lambda on the motorcycle

"We'll go ou foot," said Hex, "and meet you at the inter-block gap. Take care."

"See you soon," called Cleo as the machine spluttered into molion.

Hex, Zap and Ascii jogged cross-country through the night. They hadn't much thine, or hreath, for conversation, but in the niddle of the night Zap asked, "Do you think they let us age asked, "Do you think they let us get away?" to which Hex had no reply. Reflecting on it, though, he did think it had gone just a bit too

By morning they were high op once more in the Sierra Nueva. They arrived before the girls and Hex led Zap down the secret tunnel. The last few metres, however, were blacked by an earthfull. Ascii dag, while Hex and Zap ferried stones inboriously up to the surface, to clear a possage. When they finally broke through, Flex was un-

prepared for whot he saw.

The carpet of green moss had turned red; the tree by what had been the pond was just u charred black stump like an outsize mutchstick, and the pool itself was no more than e muddy brown puddle. Hex turned to Zap. "This place has been bombed while we were sway.

Zap glanced at the rock wolls of the crater which were glazed like porcelain, confirming Hex's aurinise. "They must have used psycho-logic to predict your movements. There's enough data on you in the Database for them to work out an extrapolation formula. The only question is:

why were they late?"
"That's just it," said Hex. "Cleo persuaded me to leave early. They obviously haven't got her on file."

"And they obviously didn't expect an endroid to change his plons for a mere human," replied Zep with a mischlevous smile. "I hope ahe gets back aoon," was Hex's response.

Ware they wise to lesve Clac end Lembda to fend for them-

1978, Richard Forsyth, RAIR Timesharing

BOOKS

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Uxbridge (89) 37188,

Tales from the computer succeeded in producing and certainly different.

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make a bad film that broadness of interest and think you should have some involves a train. If it is e artistic sensitivity sadly sort of taste of it: thriller it will be exciting, rare in the computer world. FEMININE INTUITION sion, liked and if it is a comedy it will. The pieces in his book range be funny. There is some from highly intellectual wit, think we are not of being Adam's latest rib blessed with soule. (Women, the first, rather than the first, rather mistired). thing ebout treins that to satire, to pathos, and all catches people's imagina equally ingenious and and helping them ettain their goels.

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We've had enough. Computer Libi way, London WC2.

Course to them, a boring burlesques of Chesterton and of Sabi a Rory Johnston.

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where It's kept,

We can read, this they Can work out sums, and write a bit: Store stuff, remember

We're tired of condescen-(Women, the flraf, rather-

Brochure

THE names and addresss of most suppliers of miarofilm equipment in the UK and doscriptions of their products are included in a booklet' now evolloble from the Business Equip ment Trade Association. The first 20 pages of the

bookiet pre devoted to ex-plaining what microfilm is, various types of microfilm format, photographic pro-assees, indexing and retrieval mathods; etdff training and the legal aspects of microfilm. There is also a section which presents the potential user with a checklist of points o be considered before mplementing a microfilm

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Data communications: Modular Technology gives spreading the measage, edited by Alan Simpson, 120pp. £9.95. Input Two-Nine Ltd, 7 Bensted Roed,

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